PEACE/WILLISTON
FISH & WILDLIFE
COMPENSATION
PROGRAM

BC hydro

BRITISH COLUMBIA

Fish and Fish Habitat Projects in the Williston Reservoir Watershed A Review of Peace/Williston Compensation Program Reports (1988 to 1998)

R. Rae and T. D. French
August 1999

PWFWCP Report No. 193

The Peace/Williston Fish & Wildlife Compensation Program is a cooperative venture of BC Hydro and the provincial fish and wildlife management agencies, supported by funding from BC Hydro. The Program was established to enhance and protect fish and wildlife resources affected by the construction of the W.A.C. Bennett and Peace Canyon dams on the Peace River, and the subsequent creation of the Williston and Dinosaur Reservoirs.

Peace/Williston Fish and Wildlife Compensation Program, 1011 Fourth Ave. 3rd Floor, Prince George B.C. V2L 3H9

Website: *www.bchydro.bc.ca/environment/initiatives/pwcp/*

This report has been approved by the Peace/Williston Fish and Wildlife Compensation Program Fish Technical Committee.

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FISH AND FISH HABITAT PROJECTS IN THE WILLISTON RESERVOIR WATERSHED

A REVIEW OF PEACE/WILLISTON COMPENSATION PROGRAM REPORTS (1988 TO 1998)

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ABSTRACT

BC Hydro established the Peace/Williston Fish and Wildlife Compensation Program (PWFWCP) in 1988 to compensate for the environmental and ecological effects of the W.A.C. Bennett Dam (constructed in 1968), which is located at the outlet of Williston Reservoir, and the Peace Canyon Dam (20.5 km downstream of the outlet). The PWFWCP Fish Technical Committee and Program Staff are, at this time, preparing a Fisheries Strategic Plan that will chart the direction of the fish component the Program for the next five years. The Fish Technical Committee has decided to review existing Williston Watershed files and reports for relevant fish data and for data that may be functionally pertinent to the watershed's fish communities (e.g., water quality, benthos, physical habitat and pollution) prior to developing the Strategic Plan, so that the Plan can be developed in view of "what is already known" and "what has been accomplished to date".

The primary objectives of this project are: (1) to identify fish-related work that has been done in the Williston Reservoir Watershed to date (1959 to 1998) (Phase 1 work); and (2) to review the basic findings, conclusions and recommendations of all Program-based projects (1988 to 1998) (Phase 2 work). The results of the Phase 2 work are given in this document in an annotated tabular format. The results of the Phase 1 work are given in the document: *French, T.D. 1999. Williston Reservoir Watershed: Fish and Fish Habitat, Benthos, and Water Quality Data, A Compendium of Data Sources (1959 to 1998). Peace/Williston Fish and Wildlife Compensation Program, Report No. 192. 102 pp.*

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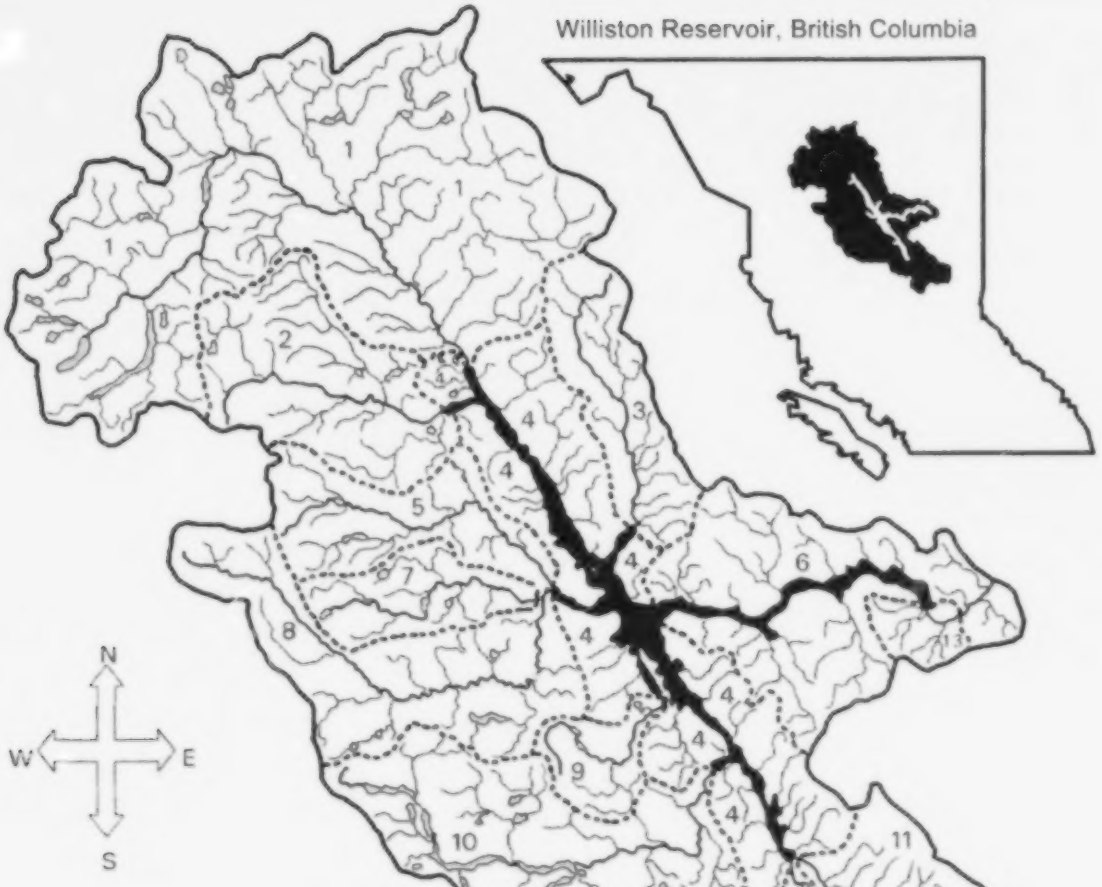
1.0 BACKGROUND AND OBJECTIVES

Williston Reservoir, having a surface area of 1,736 km^2, is by far the largest body of fresh water in British Columbia (Figure 1). The reservoir reached its full capacity in 1972, following a period of back-flooding by the W.A.C. Bennett Dam (located at the outlet of Williston Reservoir's Peace Reach). This back-flooding converted, in effect, a huge network of pristine rivers and streams (lotic environments) into a single lake-like system (lentic environment). While the ecological effects of this shift to lentic dominance have not been quantified, it is generally believed that it has resulted in dramatic changes in fish community structure; such that some species seem to have been adversely affected (e.g., Arctic grayling, mountain whitefish and rainbow trout) while others seem to have benefited (e.g., lake whitefish, bull trout and kokanee) (Langston and Blackman 1993). The mechanisms responsible for the apparent changes in fish community structure are not clearly understood, but, in all likelihood, they have both ecological (i.e., changes may reflect species/community adaptability) and sociological (the reservoir may have opened the watershed up to recreational fishers and other industries that affect fish and fish habitat) bases.

BC Hydro established the Peace/Williston Fish and Wildlife Compensation Program (PWFWCP) in 1988 to compensate for the environmental and ecological effects of the W.A.C. Bennett and the Peace Canyon (20.5 km downstream of the W.A.C. Bennett Dam) dams. The PWFWCP Fish Technical Committee and Program Staff are, at this time, developing a Strategic Plan that will chart the direction of the fish component of the Program for the next five years. The Fish Technical Committee has decided to review existing Williston Watershed files and reports for relevant fish data and for data that may be functionally pertinent to the watershed's fish communities (e.g., water quality, benthos, physical habitat and pollution) prior to developing the Strategic Plan, so that the Plan can be developed in view of "what is already known" and "what has been accomplished to date".

The primary objectives of this project are: (1) to identify fish-related work that has been done in the Williston Reservoir Watershed to date (1959 to 1998) (Phase 1 work); and (2) to review the basic findings, major conclusions and recommendations of all Program-based projects (1988 to 1998) (Phase 2 work). The results of the Phase 2 work are given in this document in an annotated tabular format. The results of the Phase 1 work are given in the document: *French, T.D. 1999. Williston Reservoir Watershed: Fish and Fish Habitat, Benthos, and Water Quality Data: A Compendium of Data Sources (1959 to 1998). PWFWCP, Report No. 192. 102 pp.* While the Phase 1 and 2 reports will help Program designates develop the Strategic Plan of the next five years, their use is limited in that the text-based format does not permit users to conduct data queries or specific data extractions. Having said this, these reports do provide a complete listing of data sources that may be used to develop a searchable database.



Key To Major Basins ..... N.T.S. Mapsheets

1. Finlay River 94-C, 94-D, 94-E, 94-F
2. Ingenika River 94-C, 94-D, 94-E, 94-F
3. Ospika River 94-B, 94-C, 94-F, 94-G
4. Williston Reservoir Residual 93-N, 93-O, 94-B, 94-C
5. Mesilinka River 94-C
6. Peace Reach 93-O, 93-P, 94-A, 94-B
7. Osilinka River 93-N, 94-C
8. Omineca River 93-M, 93-N, 94-C, 94-D
9. Manson River 93-N, 93-O
10. Nation River 93-N, 93-0
11. Parsnip River 93-I, 93-J, 93-O
12. Crooked-Pack Rivers 93-J, 93-0
13. Dinosaur Reservoir Basin 93-0

1:2450000

Figure 1. Major drainage boundaries (dashed lines) of Williston Reservoir Watershed. Basin boundaries delineated from 1:250,000 Energy, Mines and Resources contour maps (500-ft.contours). Basins named after largest mainstem(s) (shown in bold).

2.0 METHODS

2.1 REPORT ACQUISITION

The PWFWCP reports summarized in this document were obtained from the PWFWCP library, 1011 4th Avenue (3rd Floor), Prince George. Several authorities were contacted to access "draft" and "in prep." reports that have yet to be approved by Program authorities (Table 1):

TABLE 1. LIST OF VERBAL COMMUNICATIONS.

NAME	AFFILIATION	PHONE NO.	NATURE OF BUSINESS
(1) Nick Baccante	Fisheries Section, BCMELP, FSJ	(250)7873289	Provided guidance on report structure, comments on original draft of this report, and information on project reports that may not be filed in the PWFWCP library
(2) Brian Blackman	PWFWCP, PG	(250) 565 6413	Provided draft PWFWCP reports
(12) Bob Westcott	BC Hydro, Hudson's Hope	(250) 783 5058	Outlined project objectives, provided comments on drafts, and information on project reports that may not be filed in the PWFWCP library

2.2 ACRONYMS AND ABBREVIATIONS

The following acronyms and abbreviations were used whenever possible to minimize the length of this report (Table 2):

TABLE 2 (A,B,C). SPECIAL TERMS AND ABBREVIATIONS USED IN THIS DOCUMENT.

(A) SPECIES NAMES (RIC 1998)

SHORT FORM	COMMON NAME	LATIN NAME
BB	Burbot	*Lota lota*
BT	Bull trout	*Salvelinus confluentus*
CSU	Coarsescale sucker	*Catostomus macrocheilus*
CT	Cutthroat trout	*Oncorhynchus clarki*
EB	Eastern brooktrout	*Salvelinus fontinalis*
GR	Arctic grayling	*Thymallus arcticus*
KO	Kokanee	*Oncorhynchus nerka*
LKC	Lake chub	*Couesius plumbeus*
LNC	Longnose dace	*Rhinichthys cataractae*
LSU	Longnose sucker	*Catostomus catostomus*
LT	Lake trout	*Salvelinus namaycush*
LW	Lake whitefish	*Coregonus clupeaformis*
MW	Mountain whitefish	*Prosopium williamsoni*
NSC	Northern squawfish	*Ptycheilus oregonensis*
FCC	Peamouth chub	*Mylocheilus caurinus*
PW	Pygmy whitefish	*Prosopium coulteri*
RB	Rainbow trout	*Oncorhynchus mykiss*
RSC	Redside shiner	*Richardsonius balteatus*
WP	Walleye	*Stizostedion vitreum*
WSU	White sucker	*Catostomus commersoni*

(B) STANDARD LIMNOLOGICAL TERMS (SEE WETZEL 1983; WETZEL AND LIKENS 1991)

SHORT FORM	DEFINITION
A_o	Surface area of lake
d	Day
db	Decibel
D.O.	Dissolved oxygen
[D.O.]	Dissolved oxygen concentration
>	Greater than
hr.	Hour
H^2S	Hydrogen sulfide
<	Less than
mg	Milligram (10^{-3} g)
n	Sample size
N	Nitrogen
$N0_2+NO_3$	Nitrite plus nitrate
ortho-P	Ortho-phosphate
P	Phosphorus
SRP	Soluble reactive phosphorus
TN	Total nitrogen
TDP	Total dissolved phosphorus
TP	Total phosphorus
V	Volume of lake
$\bar{x}$	Average
YOY	Young-of-the-year fish
$\bar{z}$	Average depth of lake
Z^m	Maximum depth of lake

(c) GENERAL TERMS

SHORT FORM OR TERM	DEFINITION
Anoxic	< 1 $mg \cdot L^{-1}$ D.O.
Barren	Fishless waterbodies
BCMELP	British Columbia Ministry of Environment, Lands and Parks
Coelomic	Referring to body cavity (space between viscera and external body wall)
CPUE	Fish catch-per-unit-effort
d/s	Downstream
FL	Fork Length
Hypoxic	1 - 4 $mg \cdot L^{-1}$ D.O.
Isothermal	Small (if any) changes in temperature as measured in a vertical profile
LWD	Large woody debris
MOF	British Columbia Ministry of Forests
Oxic	> 4 $mg \cdot L^{-1}$ D.O.
PWFWCP	Peace Williston Fish and Wildlife Compensation Program
Stratified	Lake condition when thermocline present
TC	Total catch
Thermocline	Metalimnion present (region of water column where temperature changes are or exceed 1 °C per vertical meter)
u/s	Upstream

2.3 REPORT ORGANIZATION

2.3.1 Tabular Format

Each PWFWCP report was summarized in a tabular format. While every effort was made to summarize the major results and conclusions of each report, readers should be aware that the original reports contain information and data that were not, for practical reasons, included in our summary tables. For example, in our summaries of lake inventory reports, we included data on the morphometric parameters maximum and average depths (m), surface area (m) and volume (m^3). In addition to these data, the original reports included morphometric data on watershed area (km^2), area above 6-m contour (m^2), shoreline perimeter (m), perimeter of islands (m), number of islands (count) and elevation above sea level (m). Other data and materials included in the original reports, but not in this summary document include:

(1) bathymetric maps and associated benchmarks;
(2) photographs (including air photos);
(3) individual fish data (e.g., stomach contents, lengths, weights, gonadal maturity, ages and scale photocopies) and data on fishing methods (e.g., gill net dimensions and time set, electrofishing parameters, trapping effort);
(4) raw chemistry data (e.g., total and dissolved residues, D.O., temperature, conductance @ 25 °C, pH, H^2S, alkalinity to pH 4.5, nutrients and metals);
(5) shoreline and catchment descriptions (including comments on catchment development);
(6) road directions to study location (and road conditions and restrictions);
(7) descriptions of aquatic plant and wildlife communities;
(8) a history of previous surveys; and
(9) descriptions of inlets and outlets (e.g., fish community, channel dimensions, turbidity, temperature, stage, velocity, slope, colour, substrate characteristics, cover and bank form, and available fish habitat).

An example summary table with explanatory notes is given on the next page (Table 3). Variations to this table structure are generally self explanatory.

TABLE 3. EXAMPLE SUMMARY TABLE WITH EXPLANATORY NOTES.

Report No. 171[a] Lake Inventory[b]	***A Reconnaissance Survey of Chudnuslida Lake***[c] (54°54'45"N. 1 22°34'1 3"W: 93 J/1 5)[d]
Reference systems:[e]	***Chudnuslida Lake.*** Unnamed Creeks (3 inlets. 1 outlet). Chuyazega Creek
Sub-basin:[f]	PARSNIP RIVER
Survey date(s):[g]	October 17 and 18. 1996
Objective(s):[h]	To assess the physical, chemical and biological characteristics of Chudnuslida Lake and its immediate watershed.
Result(s)[i]	7. Thermocline between 11 and 12-m depth on sampling date; 2. Anoxic at 12m and deeper (Z^m= 16.2m; Ao = 510,222 m^2; z =6.6 m; V = 3,358,249 m^3); 3. LSU (77% TC) and RB (17%) dominated gill net catch; 4. RB seemed healthy(4 of 15 had stomach worms); 5. Outlet had suitable spawning habitat; but, fish movement to habitat impeded by blocked culvert.
Conclusion(s):[j]	Lake could support a low use RB fishery.
Recommendation(s):[k]	Could establish a Forest Recreation Site near the outlet creek; however, a nearby logging road may detract from the aesthetic appeal.
Followup:[l]	None known
Comments:[m]	7. Metals, N and P data are appended in report; 2. A lake survey was also conducted in September 1976; 3. The partially blocked culvert on outlet has raised lake levels.

[a] Number that identifies each approved PWFWCP report. At this time, there are about 193 PWFWCP reports, numbered consecutively as they were completed and approved. Each report can be obtained from the PWFWCP library, Prince George, in which they are shelved in boxes by number.

[b] Identifies the category that best describes the report: (1) Lake Inventory, (2) Stream and River Inventory, (3) Planning, (4) Enhancement, (5) Evaluation or (6) Public Consultation.

[c] Title of the PWFWCP report.

[d] Coordinates of surveyed waterbodies (mostly lakes); 1:50,000 NTS mapsheet associated with surveyed waterbody.

[e] Names of waterbodies that are discussed in the report (all waterbodies are listed so that the MS Word version of the document can be easily searched for particular waterbodies). Names in bold (e.g., Chudnuslida Lake) are those that are focussed on in the report.

[f] The sub-basin in which the project took place (i.e., one of the 13 shown on Figure 1). When the work spanned over two or more sub-basins, the names of all relevant sub-basins were listed after the word "MULTI-BASIN".

[g] Dates that the work took place on.

[h,i,j,k] Objectives, major results, conclusions and recommendations stated in each report.

[l] Projects done to follow-up on recommendations given in each report.

[m] Additional notes and clarifications.

2.3.2 Subject Categorization

The PWFWCP were first grouped into one of six subject categories (Table 4):

TABLE 4. REPORT "CHAPTERS" (PARTS A, B, C, D, E, F) BY SUBJECT CATEGORY.

SUBJECT CATEGORY (REPORT "CHAPTER")	DESCRIPTION
(1) Lake Inventory (PART A)	fish and fish habitat surveys; collection type surveys performed without specific hypotheses; recommendations for future work are made following baseline survey; enhancement opportunities are generally highlighted
(2) Stream and River Inventory (PART B)	same as Lake Inventory (except for streams and rivers)
(3) Planning (PART C)	documents that summarize past projects or suggestions for future work (long-term plans); management plans; documents that summarize information on a large number of lakes, streams or rivers; documents that identify and summarize large-scale enhancement opportunities (often fish stocking)
(4) Enhancement (PART D)	fish stocking and studies and inventories that are done in conjunction with enhancement projects (e.g., water temperature data collected for Nation and Mesilinka rivers and the Mesilinka River fertilization experiment)
(5) Evaluation (PART E)	generally follow-ups to Enhancement projects, e.g., creel surveys that assess the contribution of stocked fish to the recreational fishery, biological responses to stream fertilization
(6) Public Consultation (PART F)	documents that summarize PWFWCP activities for the general public (describe Program structure, budgets, accomplishments and objectives); educate the public on current fisheries and biodiversity issues/problems; solicit public input and participation

Thus, the report is divided into six major sections: Lake Inventory (PART A), Stream and River Inventory (PART B), Planning (PART C), Enhancement (PART D), Evaluation (PART E) and Public Consultation (PART F). The subject category is identified in the "HEADER" string of each page so that readers can move from one subject category to another without having to refer to the table of contents.

Some PWFWCP reports could be classified into more than one subject category. When this occurred, the summary table was placed in all relevant sections. For example, the report:

Zemlak, R.J., and A.R. Langston. 1997. Water Temperatures of the Nation and Mesilinka River Systems 1997. Peace/Williston Fish and Wildlife Compensation Program, Report No. 127. 16 pp.

was summarized in both the Enhancement and Inventory sections because the temperature data were collected as control references for the Mesilinka River fertilization experiment (Enhancement component); yet, the report was simply a tabulation of temperature data (Inventory component).

Projects conducted downstream of the Dinosaur Reservoir sub-basin (e.g., in the Pine River Watershed) are summarized at the end of this document (Appendix A).

2.3.3 Sub-Basin Classification

Once grouped by subject category (Section 2.3.2), the reports were grouped again into one of the 13 major sub-basins shown on Figure 1 (Table 5):

TABLE 5. WILLISTON RESERVOIR SUB-BASINS.

SUB-BASIN	CATCHMENT AREA[a] (@ 1:2,000,000)	DEFINITION
(1) Finlay River	25,400 km^2	Those containing data on waterbodies in the Finlay River system
(2) Ingenika River	6,700 km^2	Those containing data on waterbodies in the Ingenika River system
(3) Ospika River	3,600 km^2	Those containing data on waterbodies in the Ospika River system
(4) Williston Residual	12,200[b] km^2	Those containing data on waterbodies that do not drain into the major systems specified in this table (small systems that drain directly into Williston Reservoir)
(5) Mesilinka River	4,600 km^2	Those containing data on waterbodies in the Mesilinka River system
(6) Peace Reach	7,800[c] km^2	Those containing data on waterbodies that drain into the Peace Reach of Williston Reservoir
(7) Osilinka River	2,300 km^2	Those containing data on lakes and streams located Osilinka River system
(8) Omineca River	8,600 km^2	Those containing data on lakes and streams in the Omineca River system
(9) Manson River	1,900 km^2	Those containing data on waterbodies in the Manson River system
(10) Nation River	9,200 km^2	Those containing data on waterbodies in the Nation River system
(11) Parsnip River	7,100 km^2	Those containing data on water bodies in the Parsnip River system
(12) Crooked-Pack	5,500 km^2	Those containing data on waterbodies in the Crooked-Pack river systems
(13) Dinosaur Reservoir	1,100[d] km^2	Those containing data on waterbodies in the Dinosaur Reservoir system

[a] measured to mouth.
[b] includes reservoir area minus area of Peace Reach.
[c] includes Peace Reach area of Williston Reservoir.
[d] does not include area upstream of W.A.C. Bennett Dam.

Sub-basins are specified in the "HEADER" string of each page so that readers can quickly find information on a specific sub-basin within each section (subject category) without having to refer to the table of contents.

3.0 RESULTS OVERVIEW

3.1 SYNOPSIS

A total of 129 reports are summarized in this document. Approximately 67% of the documents were categorized as being either lake inventory (52%) or stream inventory (15%) (Table 6). To date, there is about one planning document produced for every three inventory reports. Public consultation reports were compiled for the years 1990/91, 1991/92 and 1992/93, for a total of three. Enhancement reports (9) and evaluation reports (11) have been produced to about a one to one ratio.

TABLE 6. NUMBER OF PWFWCP REPORTS WITHIN EACH SUBJECT CATEGORY AND SUB-BASIN. NOTE THAT SEVERAL REPORTS FALL INTO MORE THAN ONE SUBJECT CATEGORY (REASON WHY TOTALS DO NOT ADD TO 129).

SUB-BASIN	INVENTORY		PLANNING	ENHANCEMENT	EVALUATION	PUBLIC CONSULTATION	TOT.
	LAKE	STREAM					
Finlay	5	3	0	0	0	0	**8**
Ingenika	0	0	0	0	0	0	**0**
Ospika	0	0	0	0	0	0	**0**
Residual	20	1	6	0	6	0	**33**
Mesilinka	0	0	1	1	0	0	**2**
Peace Reach	6	1	1	0	1	0	**9**
Osilinka	3	0	0	0	0	0	**3**
Omineca	0	0	0	0	0	0	**0**
Manson	5	0	2	0	0	0	**7**
Nation	10	1	1	0	0	0	**13**
Parsnip	4	3	3	1	1	0	**12**
Crooked-Pack	6	0	1	0	0	0	**7**
Dinosaur Reservoir	1	1	1	0	1	0	**4**
Multi-Basin	1	9	12	6	1	0	**29**
Pine	6	0	1	1	0	0	**8**
Total	**67**	**19**	**29**	**9**	**11**	**3**	**135**

3.2 BIBLIOGRAPHICAL SUMMARY

Reports summarized in this document are listed below by Report No. (Table 7). The subject category of each report is given in the "category" column of this table:

SUBJECT CATEGORY	ABBREVIATION USED IN TABLE 7
Inventory	I
Enhancement	EP
Evaluation	EE
Planning	P
Public Consultation	PC

The page(s) where each report is summarized is given in the "page(s)" column of the table so that readers can go directly to a report of interest.

TABLE 7. BIBLIOGRAPHICAL SUMMARY.

PWFWCP Report No.	***Citation***	***Category***	***Page(s)***
A	Stockner. J.G. 1988. Williston Reservoir: With Technical Comment on Current State of Aquatic Habitat (Nutrients, Biological production). Factors Limiting Biological Production and Recommendations for Monitoring. (7 pp.)	**P**	**82**
B	Blackman. B.R., and R.J. Zemlak. DRAFT. A Strategic Plan for the Conservation and Restoration of Arctic Grayling in the Williston Reservoir Watershed. 20 pp.	**P**	**82**
C	Blackman. B.R. in prep. Peace/Williston Fish and Wildlife Compensation Program: Summary of Fisheries Activities from 1988-1996. (17 pp.)	**P**	**83,84**
9	Read, D.J. 1991. Public Consultation Report 1990/91. (16 pp.)	**PC**	**98**
17	Becker. G.K. 1992. Public Consultation Report 1991/92. (12 pp.)	**PC**	**98**
27	Bemister. C. 1993. Public Consultation Report 1992/93. (23 pp.)	**PC**	**99**
56	Retzer. C.M. 1989. Spawning and Rearing Habitat Assessment of Williston Reservoir Tributaries. (35 pp.)	**P**	**77**
57	Johnson. R.L.. and I. Yesaki. 1989. Hydroacoustic Surveys of Williston Reservoir (June. September. and October 1998). (35 pp. + Appendices A-G)	**I**	**35**
58	Blackman, B.G.. D. Jesson. D. Ableson, and T. Down. 1990. Williston Lake Fisheries Compensation Program Management Plan. (38 pp.)	**P**	**77**
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PART A. LAKE INVENTORY

Report No. 152 Lake Inventory	*A Reconnaissance Survey of Truncate Lake #3* (57°06'31"N, 125°09'51"W; 94 F/3)
Reference systems:	*Truncate Lake #3* (gazetted name = Truncate Lake), 2 inlets, 1 outlet
Sub-basin:	FINLAY RIVER
Survey date(s):	August 8, 1996
Objective(s):	To assess the physical, chemical and biological characteristics of Truncate Lake #3 and its immediate watershed.
Result(s):	1. Lake was isothermal on sampling date; 2. [D.O.] constant to 2-m depth; hypoxic at 2.5m (Z_m = 2.7m; A_o = 116,169 m^2; $\bar{Z}$ = 0.9 m; V = 100,493 m^3); 3. RB and 1 BT caught in gill nets; 4. Minnow traps caught LKC; 5. Spawning habitat (salmonid) in outlet has only limited potential; fish passage between lake and outlet obstructed by beaver dam.
Conclusion(s):	Truncate Lake #3 supports a substantive rainbow trout population.
Recommendation(s):	Conduct winter temperature/D.O. profiles to assess winter kill potential.
Follow up:	None known
Comments:	1. No suitable location for a Forest Recreation Site; 2. Metals data (surface water only) and N and P data appended in report.

Report No. 153 Lake Inventory	*A Reconnaissance Survey of Truncate Lake #1* (57°07'21"N, 125°11'31"W; 94 F/3)
Reference systems:	*Truncate Lake #1*, Unnamed Creeks (1 inlet and 1 outlet)
Sub-Basin:	FINLAY RIVER
Survey date(s):	August 9 and 10, 1996
Objective(s):	To assess the physical, chemical and biological characteristics of Truncate Lake #1 and its immediate watershed.
Result(s):	1. Lake was isothermal on sampling date; 2. [D.O.] constant through water column; hypoxic near bottom (Z_m = 1.8m); 3. No fish were caught in gill nets or minnow traps; 4. Inlet and outlet have poor spawning and rearing habitats (salmonids).
Conclusion(s):	None given
Recommendation(s):	None given
Follow up:	None known
Comments:	1. Metals (surface water only) and N and P data appended in report. 2. The lake surface was covered with macrophytes.

Report No. 154 Lake Inventory	***A Reconnaissance Survey of Unnamed Lake (Lake 8731)*** (57°21'46"N, 125°11'18"W; 94 F/6)
Reference systems:	***Lake 8731***, Unnamed Creeks (3 inlets and 1 outlet)
Sub-basin:	FINLAY RIVER
Survey date(s):	August 11, 1996
Objective(s):	To assess the physical, chemical and biological characteristics of Lake 8731 and its immediate watershed.
Result(s):	1. Thermocline present (4 to 7-m depth); 2. Hypoxic at 10.5m; anoxic from 14.5 m to bottom (Z_m = 18.5m; A_o = 50,820 m^2; $\bar{Z}$ = 5.8 m; V = 293,691 m^3); 3. No fish were caught in the gill nets or minnow traps; 4. Some salmonid spawning habitat exists in outlet, but obstructions may preclude fish from returning to lake.
Conclusion(s):	Lake 8731 is barren, but has physical conditions (temperature, oxygen, and pH) suitable for fish stocking.
Recommendation(s):	RB stocking with non-breeding fish; repeated stocking will be necessary.
Follow up:	None known
Comments:	1. Metals (surface water only) and N and P data appended in report 2. Good Forest Recreation Site potential; road access required first.

Report No. 155 Lake Inventory	***A Reconnaissance Survey of Rainbow Lake*** (57°22'33"N, 125°48'34"W; 94 F/5)
Reference systems:	***Rainbow Lake***, Unnamed Creeks (4 inlets, 1 outlet) + approx. 40 seasonal or intermittent streams
Sub-basin:	FINLAY RIVER
Survey date(s):	August 11 and 12, 1996
Objective(s):	To assess the physical, chemical and biological characteristics of Rainbow Lake and its immediate watershed.
Result(s):	1. Not thermally stratified on sampling date; 2. [D.O.] constant through water column (Z_m = 6.7m; A_o = 149,146 m^2; $\bar{Z}$ = 1.4 m; V = 198,607 m^3); 3. Only RB caught in gill nets; 4. 70% of RB had tape worms or cysts (kidneys); 23% had gill lice. 5. Some spawning habitat observed in outlet.
Conclusion(s):	Rainbow Lake has a substantive population of large RB; could support an excellent low to moderate intensity fishery.
Recommendation(s):	1. Catch and release restriction should be imposed since many fish had tapeworms and or cysts; 2. Angling in outlet should be restricted (perhaps).
Follow up:	None known
Comments:	Metals (surface water only) and N and P data appended in report.

Report No. 156 Lake Inventory	***A Reconnaissance Survey of Jack Lake*** (57°19'26"N, 125°44'18"W; 94 F/5)
Reference systems:	***Jack Lake***, Unnamed Creeks (2 inlets and 1 outlet), Stelkuz Creek
Sub-basin:	FINLAY RIVER
Survey date(s):	August 13, 1996
Objective(s):	To assess the physical, chemical and biological characteristics of Jack Lake and its immediate watershed.
Result(s):	1. Temperature decreased by 3°C from surface to 6-m depth, but lake not stratified; 2. Hypoxic at 5.5m; [D.O.] maximum observed at 3.5m (Z_m = 6.3m; A_o = 89,077 m^2; $\bar{Z}$ = 2.4 m; V = 206,223 m^3); 3. RB (44% TC), LSU (32%) and BT (20%) caught in gill nets; 4. LKC caught in minnow traps; 5. Four of five sampled BT had tapeworms (stomachs); 6. Good salmonid spawning habitat observed in inlet #1; 7. Outlet has no fisheries potential; however, very good spawning and rearing habitat in Stelkuz Creek (outlet creek flows into Stelkuz Creek).
Conclusion(s):	Jack Lake supports a small number of RB and BT; could support a low intensity fishery.
Recommendation(s):	Beaver dam on outlet should be removed to increase accessibility to Stelkuz Creek spawning habitat.
Follow up:	None known
Comments:	1. Metals (surface water only) and N and P data appended in report; 2. Bridge 300-m d/s of lake (over outlet)should be replaced.

Report No. 87 Lake Inventory	***A Reconnaissance Survey of Canty Lake*** (55°57'21"N, 123°42'23"W; 93 O/13)
Reference systems:	***Canty Lake***, Unnamed Creeks (3 inlets and 1 outlet)
Sub-basin:	WILLISTON RESERVOIR RESIDUAL
Survey date(s):	July 4, 1989 (summer) and February 27, 1990 (winter)
Objective(s):	To assess the physical, chemical and biological characteristics of Canty Lake and its immediate watershed.
Result(s):	1. Slight decrease in temperature with depth; no thermocline (summer); 2. No hypoxia observed (summer) (Z_{max} = 9.4m; A_o = 75,000 m^2; $\bar{Z}$ = 2.9 m; V = 218,000 m^3); 3. Weak inverse thermal stratification (winter); 4. [D.O.] decrease with depth; hypoxic at 7.5m (winter); 5. No fish were caught in gill nets or minnow traps; 6. Fish habitat in inlets poor; fair to good spawning and rearing habitat (salmonid) observed in u/s-most 100m of outlet.
Conclusion(s):	1. Canty Lake is a barren, sub-alpine, headwater lake; 2. Winter [D.O.] are high enough to support salmonids.
Recommendation(s):	1. Stock with RB or Yellowstone CT (1,500 - 2,500 initially); 2. Once stalked a low intensity fishery could be managed.
Follow up:	Fish Habitat Enhancement Potential and Stocking Assessment conducted in 1994, Report No. 124.

Report No. 90 Lake Inventory	***A Reconnaissance Survey of Heather Lake*** (55°30'00"N, 123°15'11"W; 93 O/6, O/11)
Reference systems:	***Heather Lake***, Unnamed Creeks (1 inlet and 1 outlet)
Sub-basin:	WILLISTON RESERVOIR RESIDUAL
Survey date(s):	June 13 and 14, 1989
Objective(s):	1. To assess the physical, chemical and biological characteristics of Heather Lake and its immediate watershed; 2. To investigate the potential of rotenone rehabilitation of Heather Lake
Result(s):	1. Fish community dominated by NSC (22% TC), MW (20%) and suckers (42%); 2. RB and BT observed relatively infrequently (< 10% TC combined); 3. No spawning habitat observed in the inlet; beaver dams obstruct u/s fish movements; 4. Outlet has moderate to good spawning habitat and moderate rearing habitat.
Conclusion(s):	None given
Recommendation(s):	1. Chemical rehabilitation would be costly; difficult to achieve total fish kill (complex system); 2. Stocking with Blackwater RB recommended (can compete with coarse

Report No. 90 Lake Inventory	***A Reconnaissance Survey of Heather Lake*** (55°30'00"N, 123°15'11"W; 93 O/6, O/11)
	fish populations).
Follow up:	Lake stocked with 5,000 native RB in May, 1992.
Comments:	1. No temperature or D.O. data given; 2. Suitable location for a Forest Recreation Site on southeast shore; 3. Lake is located within Ecological Reserve #87; 4. A Stock Assessment (1984) and a Reconnaissance Survey (1970) have been conducted; 5. Lake stocked with RB in 1972, 1981 and 1983; determined in 1984 that stocked RB had low survivorship (stocking program cancelled).

Report No. 90 (Cont.

Report No. 92 Lake Inventory	***A Reconnaissance Survey of Pothole Lake No. 1*** (55°35'44"N, 123°22'40"W; 93 O/11)
Reference systems:	*Pothole Lake No. 1*
Sub-basin:	WILLISTON RESERVOIR RESIDUAL
Survey date(s):	June 15, 1989
Objective(s):	To assess the physical, chemical and biological characteristics of Pothole Lake No. 1 and its immediate watershed.
Result(s):	1. Thermocline present on sampling date (3 to 7m); 2. Hypoxic at 24-m depth at below (Z_m = 33 m; A_o = 196,700 m^2; $\bar{Z}$ = 15.0 m; V = 2,960,000 m^3); 3. RB caught in gill net; 4. LKC caught in minnow traps; 5. Ten of 13 female RB sampled were spawnbound; 6. Fourteen of 22 RB had tapeworms or tapeworm nodules in coelom; 7. No inlets or outlets identified.
Conclusion(s):	Pothole Lake No. 1 is a closed system; lake supports a stocked RB population.
Recommendation(s):	1. Create artificial spawning stream (fish currently spawnbound); 2. Stock EB, which may use existing LKC population as a food source; 3. Upgrade the current access trail to the lake.
Follow up:	None known
Comments:	1. RB may attempt to spawn along shoreline (clean gravel patches observed); 2. Pothole Lake No. 1 was stocked with RB in 1980 - 83, 1985, 1987 and 1989; 3. A preliminary inventory of Pothole Lake No. 1 was conducted in December 1979 (lake referred to as "43 Mile" or "Pothole" Lake in BCMELP inventory files).

Report No. 95 Lake Inventory	***A Reconnaissance Survey of Tobin Lake*** (56°20'08"N, 124°10'45"W; 94 C/8)
Reference systems:	***Tobin Lake***, Unnamed Creeks (2 inlets and 1 outlet)
Sub-basin:	WILLISTON RESERVOIR RESIDUAL
Survey date(s):	August 28 and 29, 1989 (summer) and February 27, 1990 (winter)
Objective(s):	To assess the physical, chemical and biological characteristics of Tobin Lake and its immediate watershed.
Result(s):	1. Thermocline at 6 to 8-m depth (summer); 2. Hypoxic at 6.5m; anoxic at 8.5m and below (summer) (Z_m = 30m); 3. Inversely stratified on winter sampling date; 4. Hypoxic at 2-m depth and below (winter); 5. Gill nets and minnow traps caught numerous of RSC, LKC and CSU; 6. Two RB caught in gill nets;
Conclusion(s):	Tobin Lake is a suitable candidate for sport fish introductions.
Recommendation(s):	1. Stock Tobin Lake with a piscivorous RB strain (will be able to feed on abundant forage fish); 2. Gravel placement in inlet #2 may relieve a potential spawnbound condition.
Follow up:	Stocked on September 18, 1989 with 17,000 Dragon Lake RB.
Comments:	1. A reconnaissance survey of Tobin Lake was conducted by B.C. Environment, Prince George in 1981; 2. H_2S was smelled in a water sample taken at 30-m depth.

Report No. 96 Lake Inventory	***A Reconnaissance Survey of Upper Lions Lake*** (55°14'18"N, 123°06'50"W; 93 O/3)
Reference systems:	***Upper Lions Lake***, Unnamed Creek (outlet)
Sub-basin:	WILLISTON RESERVOIR RESIDUAL
Survey date(s):	September 20, 1989 (summer) and February 27, 1990 (winter)
Objective(s):	1. To assess the physical, chemical and biological characteristics of Upper Lions Lake and its immediate watershed; 2. To assess the suitability of Upper Lions Lake rotenone treatment.
Result(s):	1. Not stratified on summer sampling date; 2. [D.O.] decreased from 4-m depth to bottom; hypoxic conditions not observed (Z_m = 6.8m; A_o = 97,100 m^2; $\bar{Z}$ = 2.4 m; V = 233,000 m^3); 3. Inversely stratified on spring sampling date; 4. Hypoxic throughout water column on winter sampling date; 5. CSU and LSU caught in gill nets; RSC caught in minnow traps; 6. No salmonid spawning habitat observed in inlets; marginal rearing habitat observed in outlet.
Conclusion(s):	Winter [D.O.] too low to support a sport fish population.
Recommendation(s):	Upper Lions Lake should not be stocked.
Follow up:	None known

Report No. 98 Lake Inventory	***A Reconnaissance Survey of Blackwater Lake*** (55°29'31"N, 123°35'46"W; 93 O/5)
Reference systems:	***Blackwater Lake***, Blackwater Creek (outlet), Unnamed Creek (inlet)
Sub-basin:	WILLISTON RESERVOIR RESIDUAL
Survey date(s):	June 7 and 8, 1990 (summer) and March 19, 1991 (winter)
Objective(s):	To assess the physical, chemical and biological characteristics of Blackwater Lake and its immediate watershed.
Result(s):	1. Lake weakly stratified on summer sampling date (thermocline at 2 to 3 -m depth); 2. Hypoxic at 5-m depth on summer sampling date (Z_m = 6m; A_o = 254,000 m^2; $\bar{Z}$ = 3.3 m; V = 840,000 m^3); 3. Weak inverse stratification on winter sampling date; 4. Hypoxic at 2.5m, and anoxic at 4m and below (winter); 5. Gill nets caught LKC (69% TC), suckers (30%) and RB (< 2%); 6. Two of three RB sampled were spawnbound; 7. No salmonid spawning potential noted in inlet or outlet; beaver activity negates any enhancement potential.
Conclusion(s):	None provided
Recommendation(s):	Repeated RB stocking recommended if winter [D.O.] will support fish.
Follow up:	None known
Comments:	1. Blackwater Creek RB were broodstock for the Peace Canyon Hatchery; 2. A biophysical reconnaissance of Blackwater Creek done by B.C. Environment, Prince George, in 1990.

Report No. 101 Lake Inventory	***A Reconnaissance Survey of Grayling Lake*** (55°08'11"N, 123°11'29"W; 93 O/3)
Reference systems:	***Grayling Lake***, Unnamed Creeks (2 year-round inlets, 3 seasonal inlets and 1 outlet)
Sub-basin:	WILLISTON RESERVOIR RESIDUAL
Survey date(s):	June 25 and 26, 1990
Objective(s):	To assess the physical, chemical and biological characteristics of Grayling Lake and its immediate watershed.
Result(s):	1. Lake stratified on survey date (thermocline at 4 to 6-m depth); 2. [D.O.] maximum at 5-m depth; hypoxic at 23m (Z_m = 37.3m; A_o = 470,000 m^2; $\bar{Z}$ = 17.0 m; V = 7,990,000 m^3); 3. RB comprised 98% gill net TC; some PCC caught in minnow traps; 4. 70% of sampled RB had coelomic tapeworms/tapeworm nodules; 5. Inlet #1 has fair to good spawning habitat; 6. Outlet has good spawning and rearing habitat.
Conclusion(s):	Good RB recruitment back to lake.
Recommendation(s):	1. Improve road access to lake; manage for a low to moderate use fishery; 2. Stock assessment in 3 to 5 years in to monitor RB population; 3. Occasional stocking may boost RB population if RB population declines; 4. Remove deadfall and beaver dams to improve fish access to spawning and rearing habitats; 5. Construct coarse fish barrier on outlet to keep Williston Reservoir coarse

	fish from entering the lake.
Follow UD:	None known

Report No. 104 Lake Inventory	***A Reconnaissance Survey of Dina Lake (#5)*** (55°30'32"N, 123°16'51"W; 93 O/11)
Reference systems:	***Dina Lake (#5)***, Unnamed Creeks (2 inlets and 1 outlet)
Sub-basin:	WILLISTON RESERVOIR RESIDUAL
Survey date(s):	June 5 and 7, 1991 (summer) and March 18, 1991 (winter)
Objective(s):	To assess the physical, chemical and biological characteristics of Dina Lake (#5) and its immediate watershed.
Result(s):	1. Thermocline at 2 to 4-m depth (summer); 2. Hypoxic below 3-m depth; anoxic at 4m and below (summer) (Z_m = 11.8m; A_o = 131,000 m^2; $\bar{Z}$ = 4.4 m; V = 574,000 m^3); 3. Inversely stratified on winter sampling date; 4. Hypoxic at 3-m depth; anoxic at depths $\geq$ 4.5m (winter); 5. Suckers, RSC and NSC caught in gill nets; 6. No salmonid spawning habitat observed in inlet or outlet creeks.
Conclusion(s):	None given
Recommendation(s):	A stocking program on Dina Lake (#5) is not recommended.
Follow up:	None known
Comments:	A management plan encompassing all the Dina Lakes was produced by D.A. Jesson, Fish and Wildlife, B.C. Environment, Prince George.

Report No. 105 Lake Inventory	***A Reconnaissance Survey of Dina Lake (#7)*** (55°31'13"N, 123°17'23"W; 93 O/11)
Reference systems:	***Dina Lake (#7)***
Sub-basin:	WILLISTON RESERVOIR RESIDUAL
Survey date(s):	June 4 and 5, 1991 (summer) and March 18, 1991 (winter)
Objective(s):	To assess the physical, chemical and biological characteristics of Dina Lake (#7) and its immediate watershed.
Result(s):	1. Summer thermocline at 4 to 9-m depths; 2. Summer [D.O.] peaked at 5.5 to 6.5m; hypoxic at 10m (Z_m = 11.7m; A_o = 69,300 m^2; $\bar{Z}$ = 5.1 m; V = 356,000 m^3); 3. Inversely stratified on winter sampling date; 4. Hypoxic at 3-m depth (winter); 5. No fish were caught in gill nets or minnow traps; 6. No spawning or rearing habitat observed in tributaries.
Conclusion(s):	1. Dina Lake (#7) is barren and has no inlets or outlets; 2. Winter [D.O.] could support a sport fish population.
Recommendation(s):	Dina Lake (#7) could support a low intensity EB or RB fishery.
Follow up:	None known
Comments:	1. A management plan encompassing all the Dina Lakes was produced by D.A. Jesson, Fish and Wildlife, B.C. Environment, Prince George; 2. *Gammarus* and zooplankton were noted as being abundant.

Report No. 106 Lake Inventory	***A Reconnaissance Survey of Gataiga Lake*** (55°14'05"N, 123°03'43"W; 93 O/3)
Reference systems:	***Gataiga Lake***, Unnamed Creeks (2 inlets), Gataiga Creek (outlet)
Sub-basin:	WILLISTON RESERVOIR RESIDUAL
Survey date(s):	May 30 and 31, 1991
Objective(s):	To assess the physical, chemical and biological characteristics of Gataiga Lake and its immediate watershed.
Result(s):	1. Thermocline extended from 2 to 6-m depth; 2. Hypoxic at 6m; anoxic at and below 7m (Z_m = 12m; A_o = 409,000 m^2; $\bar{Z}$ = 5.6 m; V = 2,274,000 m^3); 3. Fish community dominated by peamouth chub (48% TC), RB (25%) and suckers (24%); 4. Seven of 41 RB sampled had coelomic tapeworms; 5. Some female RB had released their eggs; 6. Inlet #1 has no salmonid rearing habitat, but has fair juvenile rearing habitat; 7. Inlet #2 has no salmonid spawning habitat and marginal rearing habitat; 8. The outlet has 100% organic substrate (unsuitable for salmonid spawning).
Conclusion(s):	None given
Recommendation(s):	Manage native RB population.
Follow up:	None known

Report No. 109 Lake Inventory	***A Reconnaissance Survey of Shoal Lake (#2)*** (55°49'15"N, 124°04'43"W; 93 N/16)
Reference systems:	***Shoal Lake (#2)***, Unnamed Creek (outlet)
Sub-basin:	WILLISTON RESERVOIR RESIDUAL
Survey date(s):	June 18 and 19, 1991 (summer) and March 19, 1991(winter)
Objective(s):	To assess the physical, chemical and biological characteristics of Shoal Lake (#2) and its immediate watershed.
Result(s):	1. Isothermal on summer sampling date; 2. Summer [D.O.] decreased with depth; all concentrations > 4mg/L (Z_m = 6.3m; A_o = 325,000 m^2; $\bar{Z}$ = 2.6 m; V = 839,000 m^3); 3. Inversely stratified on winter sampling date; 4. Hypoxic at 2m; anoxic at 3m and deeper (winter); 5. Only suckers and RSC were observed (gill nets and minnow traps); 6. No spawning habitat was identified in the outlet creek.
Conclusion(s):	1. Stocked fish would be chronically spawnbound; 2. Stocking (if any) would need to be repeated.
Recommendation(s):	None provided
Follow up:	None known

Report No. 111 Lake Inventory	***A Reconnaissance Survey of Dina Lake (#3)*** (55°31'24"N, 123°17'00"W, 93 O/11)
Reference systems:	*Dina Lake (#3)*, Unnamed Creek (1 inlet)
Sub-basin:	WILLISTON RESERVOIR RESIDUAL
Survey date(s):	June 4 and 5, 1992 (summer), March 18, 1991 (winter) and February 3, 1992 (winter)
Objective(s):	To assess the physical, chemical and biological characteristics of Dina Lake (#3) and its immediate watershed.
Result(s):	1. Summer thermocline at 2 to 9-m depth; 2. Summer hypoxia at 8m; anoxic at 10m (Z_m = 12.4m; A_o = 171,800 m^2; $\bar{Z}$ = 4.4 m; V = 749,000 m^3); 3. Inversely stratified during on both winter sampling dates; 4. Winter hypoxia at 2m in 1991 and 1992; anoxic at 4m in 1991 and 5m in 1992; 5. No fish caught (gill nets and minnow traps); 6. Inlet has poor and good spawning and rearing habitats, respectively; 7. High *Gammarus* densities observed.
Conclusion(s):	Dina Lake (#3) is barren; lake could support a stocked sportfish population.
Recommendation(s):	If lake is stocked, gravel placement and habitat complexing in inlet could increase production.
Follow up:	Dina Lake (#3) stocked on September 1, 1992 with 5,000 Dragon Lake RB.
Comments:	A management plan for all Dina Lakes has been prepared (D.A. Jesson).

Report No. 113 Lake Inventory	***A Reconnaissance Survey of Dina Lake (#6)*** (55°30'36"N, 123°17'14"W, 93 O/11)
Reference systems:	*Dina Lake (#6)*, Unnamed Creeks (2 inlets and 1 outlet)
Sub-basin:	WILLISTON RESERVOIR RESIDUAL
Survey date(s):	June 10 and 11, 1993 (summer) and March 19, 1991 (winter)
Objective(s):	To assess the physical, chemical and biological characteristics of Dina Lake (#6) and its immediate watershed.
Result(s):	1. Summer thermocline at 3 to 5-m depth; 2. Summer [D.O.] maximum at 3.5 - 4m; hypoxic at 7m; anoxic at 8m and deeper (Z_m = 18.1m; A_o = 152,000 m^2; $\bar{Z}$ = 4.7 m; V = 707,000 m^3); 3. Weak inverse stratification on winter sampling date; 4. Winter hypoxia at 1m; anoxic below 2m; 5. NSC comprised 99% of TC (gill nets and minnow traps); 6. No spawning or rearing habitat was identified in tributary streams.
Conclusion(s):	1. Dina Lake (#6) supports a population of coarse fish; 2. High winter kill potential (low winter [D.O.]).
Recommendation(s):	None recommended
Follow up:	None known
Comments:	A management plan for all Dina Lakes has been prepared (D.A. Jesson).

Report No. 114 Lake Inventory	***A Reconnaissance Survey of Lost Lake*** (55°19'47"N, 123°02'55"W, 93 O/6)
Reference systems:	***Lost Lake***, 3 seasonal inlet creeks
Sub-basin:	WILLISTON RESERVOIR RESIDUAL
Survey date(s):	June 11 and 12, 1993 (summer) and March 2, 1994 (winter)
Objective(s):	To assess the physical, chemical and biological characteristics of Lost Lake and its immediate watershed.
Result(s):	1. Summer thermocline between 3 and 8-m depth; 2. Summer anoxia at 8m and deeper (Z_m = 15.5m; A_o = 96,000 m^2; $\bar{Z}$ = 6.0 m; V = 575,000 m^3); 3. Inversely stratified on winter sampling date; 4. Winter hypoxia at 2m; 5. No fish were caught in gill nets or minnow traps; 6. No spawning or rearing habitat was found in inlets; 7. Suitable spawning habitat was observed along the lake shore.
Conclusion(s):	Despite low winter [D.O.], Lost Lake may support stocked fish populations (e.g., EB or female Pennask RB).
Recommendation(s):	None provided
Follow up:	None known

Report No. 157 Lake Inventory	***A Reconnaissance Survey of Unnamed Lake (Bluff Hill Lake #4)*** (56°50'45"N, 122°00'28"W; 94 C/14, C/15)
Reference systems:	***Bluff Hill Lake #4***, Unnamed Creeks (2 year-round inlets, 1 intermittent inlet and 1 outlet)
Sub-basin:	WILLISTON RESERVOIR RESIDUAL
Survey date(s):	August 23 and 24, 1996
Objective(s):	To assess the physical, chemical and biological characteristics of Bluff Hill Lake #4 and its immediate watershed.
Result(s):	1. Lake isothermal on sampling date; 2. [D.O.] same through water column; hypoxic near bottom sediments (Z_m = 7m; A_o = 287,626 m^2; $\bar{Z}$ = 2.2 m; V = 638,193 m^3); 3. No fish were caught in gill nets or minnow traps; 4. Inlets and outlets cannot support a fishery.
Conclusion(s):	Bluff Hill Lake #4 could support a RB population if stocked repeatedly triploid, all-female stock.
Recommendation(s):	None provided
Follow up:	None known
Comments:	1. Forest Recreation Site potential on lakeshore; 2. Dense invertebrate community observed; 3. Metals (surface only) and N and P data are appended in report.

Report No. 158 Lake Inventory	*A Reconnaissance Survey of Unnamed Lake (Bluff Hill Lake #2)* (56°50'36"N, 125°02'17"W; 94 C/14)
Reference systems:	*Bluff Hill Lake #2*, Unnamed Creeks (1 inlet and 1 outlet)
Sub-basin:	WILLISTON RESERVOIR RESIDUAL
Survey date(s):	August 25 and 26, 1996
Objective(s):	To assess the physical, chemical and biological characteristics of Bluff Hill Lake #2 and its immediate watershed.
Result(s):	1. Lake isothermal and [D.O.] constant through water column (Z_m = 3.5m; A_o = 139,304 m^2; $\bar{Z}$ = 1.1 m; V = 15,663 m^3); 2. RB and LKC caught in gill nets and minnow traps; 3. RB appeared healthy; few had gill lice or other parasites; 4. Spawning habitat sparse in inlet; four sets of falls obstruct fish passage; 5. Outlet has suitable spawning habitat and good rearing habitat.
Conclusion(s):	No specific conclusions were made.
Recommendation(s):	None given
Follow up:	None known
Comments:	Metals (surface only) and N and P data appended in report.

Report No. 159 Lake Inventory	*A Reconnaissance Survey of Unnamed Lake (White Lake)* (56°52'20"N, 125°09'11"W; 94 C/14)
Reference systems:	**White Lake**, Unnamed Creeks (6 year-round inlets, 4 intermittent inlets and 1 outlet)
Sub-basin:	WILLISTON RESERVOIR RESIDUAL
Survey date(s):	August 26 and 27, 1996
Objective(s):	To assess the physical, chemical and biological characteristics of White Lake and its immediate watershed.
Result(s):	1. Lake isothermal on sampling date; 2. Oxic through water column on sampling date (Z_m = 4.4; A_o = 79,694 m^2; $\bar{Z}$ = 1.2 m; V = 96,467 m^3); 3. No fish were caught in gill nets or minnow traps; 4. Inlets and outlet have no fisheries potential.
Conclusion(s):	1. Lake is barren; 2. [D.O.] could support a fish population.
Recommendation(s):	1. Stock with a small number of triploid, all-female RB; 2. Assess winter oxygen/temperature conditions to assess winter kill potential.
Follow up:	None known
Comments:	1. Metals (surface water only) and N and P data appended in report; 2. Potential for Forest Recreation Site development; 3. Variety of salmonid food-types observed.

Report No. 161 Lake Inventory	***A Reconnaissance Survey of Lafferty Lake*** (56°30'01"N, 124°15'16"W; 94 C/8, C/9)
Reference systems:	***Lafferty Lake***, Unnamed Creeks (3 inlets, 1 intermittent outlet, and 1 year round outlet)
Sub-basin:	WILLISTON RESERVOIR RESIDUAL
Survey date(s):	September 11 and 12, 1996
Objective(s):	To assess the physical, chemical and biological characteristics of Lafferty Lake and its immediate watershed.
Result(s):	1. Lake isothermal on sampling date; 2. [D.O.] constant from surface to 6-m depth; gradual decrease from 6m to bottom; all [D.O.] > 4 mg/L (Z_m = 6.4m; A_o = 149,335 m^2; $\bar{Z}$ = 2.1 m; V = 303,442 m^3); 3. RB only species caught in gill nets; 4. Twenty of 30 RB sampled had gill lice; 5. Some salmonid spawning habitat was observed in inlet #2; 6. Year-round outlet had some suitable spawning habitat and excellent rearing habitat.
Conclusion(s):	1. Lake could support a moderate to moderately high RB fishery; 2. Remove part of outlet beaver dam to improve access to spawning sites.
Recommendation(s):	No specific recommendations were provided.
Follow up:	None known
Comments:	1. Metals (surface only) and N and P data are appended in report; 2. *Gammarus*, *Daphnia*, chironomids and caddisfly larvae were abundant.

Report No. 163 Lake Inventory	***A Reconnaissance Survey of Unnamed Lake (Lake D11,000)*** (56°20'16"N, 124°14'08"W; 94 C/8)
Reference systems:	***Lake D11,000***: Unnamed Creeks (2 inlets and 1 outlet)
Sub-basin:	WILLISTON RESERVOIR RESIDUAL
Survey date(s):	September 14 and 15, 1996
Objective(s):	To assess the physical, chemical and biological characteristics of Lake D11,000 and its immediate watershed.
Result(s):	1. Lake isothermal on survey date; 2. [D.O.] remained constant (±) through water column (Z_m = 7.2m; A_o = 59,861 m^2; $\bar{Z}$ = 2.3 m; V = 132,296 m^3); 3. No fish caught in gill nets or minnow traps; 4. Inlet and outlet creeks have no fisheries potential.
Conclusion(s):	1. [D.O.] and temperature could support a stocked fish population; 2. Stocking would have to be repeated (no suitable spawning habitat).
Recommendation(s):	None provided
Follow up:	None known
Comments:	1. Metals (surface only) and N and P data are appended in report; 2. *Gammarus*, copepods and water beetles were abundant.

Report No. 164 Lake Inventory	***A Reconnaissance Survey of Unnamed Lake (Crash Lake)*** (56°23'35"N, 124°09'56"W; 94 C/8)
Reference systems:	***Crash Lake***, Unnamed Creeks (2 inlets and 1 outlet)
Sub-basin:	WILLISTON RESERVOIR RESIDUAL
Survey date(s):	September 15 and 16, 1996
Objective(s):	To assess the physical, chemical and biological characteristics of Crash Lake and its immediate watershed.
Result(s):	1. Thermocline present between 6 and 9-m depth (Z_m = 21.1m; A_o = 193,682 m^2; $\bar{Z}$ = 7.6 m; V = 1,464,880 m^3); 2. D.O. data are inaccurate (equipment malfunction); 3. Gill nets caught RB and LSU; 4. 43% of sampled RB had gill and/or fin lice; 5. Some salmonid spawning habitat observed in inlet #1 and outlet.
Conclusion(s):	Lake can support a low to medium intensity fishery.
Recommendation(s):	No specific recommendations were provided.
Follow up:	None known
Comments:	Metals (surface water only) and N and P data are appended in report.

Report No. 57 Lake Inventory	***Hydroacoustic Surveys of Williston Reservoir (June, September, and October, 1988***
Reference systems:	***Williston Reservoir***
Sub-basin:	WILLISTON RESERVOIR RESIDUAL
Survey date(s):	June 24 - July 5, 1988 (summer), September 1 - 7, 1988 and October 23 - November 5, 1988 (autumn)
Objective(s):	To assess pelagic fish distributions and abundance (document absolute abundance/densities and size distributions);
Result(s):	1. A wide size distribution observed on all three sampling dates (based on target strength data); 2. No difference in size distributions observed between sampling dates; most returns were between -55 and -35db (-60db = 20mm FL; -30db = 850mm FL); 3. July abundance = 2.485 X 10^6; September = 6.182 X 10^6; October = 5.150 X 10^6; 4. In June, three times as many fish were observed in the Peace Reach than in either of the other two reaches; 5. In September, most fish were found in the Peace Reach, followed by the Parsnip and Finlay reaches; 6. In October, the majority of fish were in the Parsnip Reach, followed by the Finlay and Peace reaches.
Conclusion(s):	No specific conclusions given.
Recommendation(s):	1. Acoustic surveys should be conducted in September (when nights are long/fish in pelagic zone); 2. Surveys should be conducted between the last and first quarter of the lunar cycle (maximum darkness).
Follow up:	None known
Comments:	Seven Appendices are included with this report: (1) Appendix A: System components and parameters; (2) Appendix B: Dual-beam analyses methods; (3) Appendix C: Population summary tables; (4) Appendix D: Target strength vs. depth tables; (5) Appendix E: Target strength vs. depth tables; (6) Appendix F: 3D plots of target strength vs. depth; and (7) Appendix G: Echograms.

Report No. 89 Lake Inventory	***A Reconnaissance Survey of Dunlevy Lake*** (56°09'08"N, 122°25'06"W; 94 B/1)
Reference systems:	***Dunlevy Lake***, Unnamed Creek (outlet)
Sub-basin:	PEACE REACH
Survey date(s):	July 16 and 17, 1989 (summer) and March 30, 1990 (winter)
Objective(s):	To assess the physical, chemical and biological characteristics of Dunlevy Lake and its immediate watershed.
Result(s):	1. Summer thermocline between 3 and 6-m depth; 2. Summer hypoxia at 8m (Z_m = 8.5m; A_o = 307,300 m^2; $\bar{Z}$ = 2.6 m; V = 794,000 m^3); 3. Inversely stratified on winter sampling date; 4. Winter hypoxia from surface to 2m; anoxic below 3-m contour; 5. No fish caught in gill net or minnow traps; 6. Outlet has no salmonid spawning habitat and limited rearing habitat; 7. No enhancement opportunities observed.
Conclusion(s):	Winter [D.O.] will not support fish.
Recommendation(s):	Dunlevy Lake should not be stocked.
Follow up:	None known
Comments:	No inlet creeks observed.

Report No. 103 Lake Inventory	***A Reconnaissance Survey of Clearwater Lake*** (55°36'40"N, 122°52'48"W; 93 O/10)
Reference systems:	***Clearwater Lake***, Clearwater Creek, Unnamed Creeks (1 outlet, 2 inlets plus 2 seasonal inlets)
Sub-basin:	PEACE REACH
Survey date(s):	September 7 and 8, 1991 (autumn) and March 18, 1991 (winter)
Objective(s):	To assess the physical, chemical and biological characteristics of Clearwater Lake and its immediate watershed.
Result(s):	1. Lake isothermal on summer sampling date; 2. Summer [D.O.] well above hypoxia (Z_m = 3.8m; A_o = 181,000 m^2; $\bar{Z}$ = 1.9 m; V = 347,000 m^3); 3. Inversely stratified on winter sampling date; hypoxic below 1.5m; 4. Twenty-six BT caught in gill nets; four angled; 5. Outlet has marginal salmonid spawning habitat and good rearing habitat; *series of five beaver dams may restrict fish movements;* 6. Inlet #1 has no spawning habitat, but good rearing habitat.
Conclusion(s):	Lake supports a BT population.
Recommendation(s):	1. Outlet beaver dams could be removed; 2. BT population should be further protected (restrict access and development).
Follow up:	None known
Comments:	1. Six BT pairs observed in outlet (spawning colours); no redds noted; 2. A biophysical reconnaissance of Clearwater Creek was conducted in 1989.

Report No. 108 Lake Inventory	***A Reconnaissance Survey of Little Carbon Lake*** (55°58'46"N, 122°35'44"W; 93 O/15)
Reference systems:	***Little Carbon Lake***, Unnamed Creeks (1 intermittent inlet and 1 outlet), Carbon Creek
Sub-basin:	PEACE REACH
Survey date(s):	July 23, 1991 (summer) and March 18, 1991 (winter)
Objective(s):	To assess the physical, chemical and biological characteristics of Little Carbon Lake and its immediate watershed.
Result(s):	1. Weak thermocline between 5 and 6-m depth on summer sampling date; 2. Summer [D.O.] > 4 mg/L through water column; maximum [D.O.] at 6-m depth (Z_m = 8.7m; A_o = 37,300 m^2; $\bar{Z}$ = 4.1 m; V = 151,500 m^3); 3. Inversely stratified on winter sampling date; hypoxic at 3.5m; anoxic from 5m to bottom; 4. No fish were caught in gill nets or minnow traps; 5. Suitable spawning habitat along shoreline; no spawning or rearing habitat noted in inlets or outlet; 6. Outlet had numerous cascades and falls (fish barriers); 7. Freshwater shrimp observed ("moderate" densities.
Conclusion(s):	Lake could support stocked sport fish.
Recommendation(s):	Should assess potential effects/interactions of introduced sport fish on native populations before any stocking program is initiated.
Follow up:	None known
Comments:	Little Carbon Lake's outlet flows into Carbon Creek 5 km d/s of lake; Carbon Creek was stocked with RB and KO in 1990, 1991 and 1992.

Report No. 137 Lake Inventory	***A Reconnaissance Survey of Emerslund Lake (Lower)*** (56°23'05"N, 123°04'25"W, 94 B/6)
Reference systems:	***Emerslund Lake (Lower)***, Emerslund Creek (outlet), Unnamed Creeks (1 year-round inlet, 7 intermittent inlets)
Sub-basin:	PEACE REACH
Survey date(s):	June 19 - 20, 1993
Objective(s):	To assess the physical, chemical and biological characteristics of Emerslund Lake (Lower) and its immediate watershed.
Result(s):	1. Thermocline between 7 and 9-m depth on sampling date; 2. Hypoxic at 11m and deeper (Z_m = 13.7m; A_o = 150,000 m^2; $\bar{Z}$ = 4.8 m; V = 725,000 m^3); 3. MW and LW dominated fish community; BT, LSU and LKC also caught; 4. Inlet had adequate spawning and good rearing habitats; outlet had moderate spawning and rearing habitats; 5. No fish barriers observed between Upper and Lower Emerslund lakes.
Conclusion(s):	Lower Emerslund Lake supports "adequate" BT and MW/LW sport fisheries.
Recommendation(s):	None given
Follow up:	None known
Comments:	Aquatic insects were abundant.

Report No. 138 Lake Inventory	*A Reconnaissance Survey of Emerslund Lake (Upper)* (56°23'27"N, 123°03'33"W; 94 B/6)
Reference systems:	*Emerslund Lake (Upper)*, Unnamed Creeks (5 inlets including 1 intermittent stream, 1 outlet)
Sub-basin:	PEACE REACH
Survey date(s):	June 20 and 21, 1993
Objective(s):	To assess the physical, chemical and biological characteristics of Emerslund Lake (Upper) and its immediate watershed.
Result(s):	1. Lake more-or-less isothermal on sampling date; 2. [D.O.] > 4 mg/L through water column; slight decline below 7-m contour (Z_m = 11.5m; A_o = 170,000 m^2; $\bar{Z}$ = 5.7 m; V = 964,000 m^3); 3. MW (65% TC), LW (33%) and BT (2%) caught in gill nets; 4. Inlet #5 had good spawning and rearing habitats; 5. Outlet had poor to fair spawning habitat and some good rearing habitat.
Conclusion(s):	None provided
Recommendation(s):	None provided
Follow up:	None known
Comments:	Inlet beaver dams restrict fish movements.

Report No. 162 Lake Inventory	*A Reconnaissance Survey of Unnamed Lake (West Nabesche Lake)* (56°13'14"N, 23°28'37"W; 94 B/3)
Reference systems:	*West Nabesche Lake*, Unnamed Creeks (1 inlet, 1 outlet)
Sub-basin:	PEACE REACH
Survey date(s):	September 13 and 14, 1996
Objective(s):	To assess the physical, chemical and biological characteristics of West Nabesche Lake and its immediate watershed.
Result(s):	1. Thermocline between 11 and 13-m depth; 2. [D.O.] > 4 mg/L through water column; maximum at 12 to 13 m (Z_m = 21.6m; A_o = 308,314 m^2; $\bar{Z}$ = 6.1 m; V = 1,818,352 m^3); 3. No fish were caught in gill nets or minnow traps; 4. Inlet and outlet creeks had rearing habitat; no spawning habitat observed.
Conclusion(s):	Lake would need repeated fish stocking (no spawning gravel available).
Recommendation(s):	None provided
Follow up:	None known
Comments:	1. Metals (surface only) and N and P data appended in report; 2. Lake is only accessible by helicopter.

Report No. 165 Lake Inventory	***A Reconnaissance Survey of Upper Tenakihi Lake*** (56°10'43"N, 125°27'37"W, 94 C/8)
Reference systems:	***Upper Tenakihi Lake***, Tenakihi Creek (major inlet), Tenakihi Creek (outlet), Unnamed Creek (8 minor inlets and 20 intermittent inlets)
Sub-basin:	OSILINKA RIVER
Survey date(s):	September 24 and 25, 1996
Objective(s):	To assess the physical, chemical and biological characteristics of Upper Tenakihi Lake and its immediate watershed.
Result(s):	1. Lake isothermal on sampling date; [D.O.] similar through water column (Z_m = 24m; A_o = 432,707 m^2; $\bar{Z}$ = 9.2 m; V = 3,992,932 m^3); 2. Only one sculpin caught (minnow traps and monofilament gill net); 3. Tenakihi Creek (u/s and d/s of lake) and inlet #8 have good to excellent spawning habitat; 4. Many caddisfly larvae and other aquatic insects observed.
Conclusion(s):	Temperature, [D.O.] and pH ($\bar{X}$ = 7.55) suitable for fish populations.
Recommendation(s):	Stock lake with Osilinka or Mesilinka GR.
Follow up:	None known
Comments:	1. Metals (surface only) and N and P data appended in report; 2. Good Forest Recreation Site potential; 3. A trapper or guide outfitter cabin located on outlet.

Report No. 166 Lake Inventory	***A Reconnaissance Survey of Middle Tenakihi Lake*** (56°11'40"N, 125°25'52"W; 94 C/8)
Reference systems:	***Middle Tenakihi Lake***, Tenakihi Creek (inlet and outlet), Unnamed Creeks (14 inlets)
Sub-basin:	OSILINKA RIVER
Survey date(s):	September 26 and 27, 1996
Objective(s):	To assess the physical, chemical and biological characteristics of Tenakihi Lake and its immediate watershed.
Result(s):	1. Isothermal on sampling date; [D.O.] constant through water column (Z_m = 7.3m); 2. No fish were caught in minnow traps or gill nets; 3. Tenakihi Creek has excellent spawning habitat (u/s and d/s of lake).
Conclusion(s):	Lake is a good candidate for a stocking program; no piscivores observed.
Recommendation(s):	Stock lake with Osilinka or Mesilinka GR.
Follow up:	None known
Comments:	1. Metals (surface only) and N and P data appended in report; 2. Trapper or guide outfitter's cabin located 600m u/s of lake; 3. Good location for a Forest Recreation Site; 4. Area has high aesthetic values.

Report No. 141 Lake Inventory	***A Reconnaissance Survey of Teegee Lake*** (55°43'39"N, 125°29'12"W; 93 N/11)
Reference systems:	***Teegee Lake***, Unnamed Creeks (10 inlets and 1 outlet)
Sub-basin:	OMINECA RIVER
Survey date(s):	June 28 and 29, 1996
Objective(s):	To assess the physical, chemical and biological characteristics of Teegee Lake and its immediate watershed.
Result(s):	1. Thermocline between 1 am 4-m depth on sampling date; 2. Hypoxic below 6m; anoxic below 8m (Z_m = 10m, A_o = 94,449 m^2; $\bar{Z}$ = 1.3 m; V = 115,942 m^3); 3. RB (86% TC) and LSU (14%) caught in gill nets, LKC (96% TC) caught in minnow traps; 4. Inlet #1b has some fisheries potential; however, four beaver dams located near mouth obstruct fish movements; 5. Inlet #6 has good rearing habitat near mouth; 6. Outlet has good spawning habitat; however, beaver dams may restrict fish movements.
Conclusion(s):	Lake could support a low use fishery.
Recommendation(s):	Breach (partial) outlet beaver dams to improve fish access to outlet.
Follow up:	None known
Comments:	1. Metals (surface only) and N and P data appended in report; 2. Potential Forest Recreation Site on north shore.

Report No. 88 Lake Inventory	***A Reconnaissance Survey of Curve Lake*** (55°43'15"N, 123°58'43"W; 93 O/12)
Reference systems:	***Curve Lake***, Unnamed Creeks (3 inlets, 1 outlet)
Sub-basin:	MANSON RIVER
Survey date(s):	June 19 and 20, 1989
Objective(s):	To assess the physical, chemical and biological characteristics of Curve Lake and its immediate watershed.
Result(s):	1. Thermocline between 3 and 5-m depth on sampling date; 2. Hypoxic at 4m; anoxic at 5m (Z_m = 8m; A_o = 501,000 m^2; $\bar{Z}$ = 3.1 m; V = 1,540,000 m^3); 3. Fish community dominated by CSU (41% TC), NSC (38%) and RB (14%); 4. RB heavily parasitized by tapeworms (flesh soft and white); 5. No salmonid spawning habitat identified in inlets; outlet had spawning habitat and fair to good rearing habitat.
Conclusion(s):	1. Coarse fish were very abundant; 2. Hypoxic conditions restrict fish to upper strata where they are highly vulnerable to parasites.
Recommendation(s):	1. Chemical rehabilitation inappropriate (extensive shallows and marshy areas); 2. Habitat complexing and spawning gravel additions to outlet may increase salmonid recruitment; however, lake may have already reached its biomass carrying capacity.
Follow up:	None known
Comments:	Lake within an MOF Recreation Reserve.

Report No. 145 Lake Inventory	***A Reconnaissance Survey of Spring Lake*** (55°22'44"N, 124°00'14"W; 93 N/8, O/5)
Reference systems:	***Spring Lake***, Unnamed Creeks (1 inlet and 1 outlet)
Sub-basin:	MANSON RIVER
Survey date(s):	July 12 and 13, 1996
Objective(s):	To assess the physical, chemical and biological characteristics of Spring Lake and its immediate watershed.
Result(s):	1. Thermocline extended from surface to 5-m depth contour; 2. Hypoxic at 5.5m; anoxic at 6m and deeper (Z_m = 13.5m; A_o = 189,210 m^2; $\bar{Z}$ = 5.3 m; V = 981,746 m^3); 3. Gill nets caught RSC (33% TC), LSU (30%), RB (22%) and WSU (15%); 4. RSC and sculpins also caught in minnow traps; 5. Inlet side channel had good to excellent RB spawning substrate; fish passage to substrate obstructed by a d/s beaver dam; 6. Outlet has good spawning habitat; beaver dam hinders fish access.
Conclusion(s):	Lake supports a "moderately" sized RB population; could support a low use fishery.
Recommendation(s):	Opening beaver dams would increase fish access to spawning sites.
Follow up:	None known
Comments:	1. Metals (surface only) and N and P data are appended in report; 2. Good location for a Forest Recreation Site.

Report No. 149 Lake Inventory	***A Reconnaissance Survey of Connaghan Lake*** (55°29'24"N, 124°16'26"W; 93 N/8)
Reference systems:	***Connaghan Lake***, Unnamed Creeks (4 inlets and 1 outlet)
Sub-basin:	MANSON RIVER
Survey date(s):	July 25 and 26, 1996
Objective(s):	To assess the physical, chemical and biological characteristics of Connaghan Lake and its immediate watershed.
Result(s):	1. Thermocline between 1 and 6-m depth on sampling date; 2. Hypoxic at 20m (Z_{eu} = 20.6m; A_o = 321,369 m^2; $\bar{Z}$ = 5.3 m; V = 1,526,344 m^3); 3. No fish caught in gill nets or minnow traps; 4. Lake was acidic (pH = 5.6); 5. Inlets have no fisheries potential; 6. Outlet creek had good spawning habitat; some spawning habitat available along shoreline.
Conclusion(s):	Lake is barren.
Recommendation(s):	1. Lake could be stocked with Gaffney Lake #3 RB; or, with LT and whitefish (latter to be a food source for the former); 2. Opening beaver dams would improve fish access to spawning areas; 3. Measure winter temperature/[D.O.] conditions to assess winter kill potential (before stocking).
Follow up:	None known
Comments:	1. Metals (surface only) and N and P data are appended in report; 2. Lake formerly known as Gaffney Lake #1; 3. Good location for Forest Recreation Site; 4. *Gammarus* and other aquatic invertebrates were abundant.

Report No. 150 Lake Inventory	***A Reconnaissance Survey of Unnamed Lake (Gaffney Lake #3)*** (55°27'58"N, 124°15'06"W; 93 N/8)
Reference systems:	***Gaffney Lake #3***, Unnamed Creeks (1 inlet and 1 outlet) and approximately 18 intermittent inlets
Sub-basin:	MANSON RIVER
Survey date(s):	July 26 and 27, 1996
Objective(s):	To assess the physical, chemical and biological characteristics of Gaffney Lake #3 and its immediate watershed.
Result(s):	1. Thermocline between 5 and 7-m depth; 2. Hypoxic at 8.5m; anoxic below 9m; maximum [D.O.] between 5 and 7 m (Z_{eu} = 14m; A_o = 289,995 m^2; $\bar{Z}$ = 3.7 m; V = 1,042,745 m^3); 3. RB only fish species observed; 87% had coelomic parasites (including tapeworms); 4. Outlet and tributary to outlet had good spawning substrate.
Conclusion(s):	None given
Recommendation(s):	Some Gaffney Lake #3 RB could be transplanted to Gaffney Lake #1 (now known as Connaghan Lake).
Follow up:	None known
Comments:	1. Lake ideal for family fishing trips (RB easily angled); 2. Good location for Forest Recreation Site (could serve Gaffney Lake #3 and Connaghan lakes).

Report No. 151 Lake Inventory	***A Reconnaissance Survey of Unnamed Lake (Gaffney Lake #4)*** (55°28'04"N, 124°14'15"W; 93 N/8)
Reference systems:	***Gaffney Lake #4***, Unnamed Creeks (2 inlets and 1 outlet)
Sub-basin	MANSON RIVER
Survey date(s):	July 28 and 29, 1996
Objective(s):	To assess the physical, chemical and biological characteristics of Gaffney Lake #4 and its immediate watershed.
Result(s):	1. Thermocline (very weak) between 2 and 8-m depth; 2. [D.O.] > 4 mg/L through water column (Z_m = 19.8m; A_s = 444,314 m^2; $\bar{Z}$ = 7.2 m; V = 3,119,578 m^3); 3. Only RB caught in the gill nets; 4. 48% of RB had coelomic parasites (including tapeworms); 5. Outlet and inlet #2 had good spawning substrate; beaver dams and log jams may restrict fish movements.
Conclusion(s):	None specifically mentioned.
Recommendation(s):	1. A catch and release fishery recommended; manage in conjunction with Gaffney Lake #3 fishery (see report # 150); 2. Opening of beaver dams and log jams would improve fish access to spawning substrate.
Follow up:	None known
Comments:	Good location for Forest Recreation Site.

Report No. 93 Lake Inventory	*A Reconnaissance Survey of Robinson Lake* (55°03'15"N, 123°25'37"W; 93 O/3)
Reference systems:	*Robinson Lake*, Robinson Creek (outlet)
Sub-basin:	NATION RIVER
Survey date(s):	July 18, 1989
Objective(s):	To assess the physical, chemical and biological characteristics of Robinson Lake and its immediate watershed.
Result(s):	1. Thermocline between 3 and 5-m depth on sampling date; 2. Hypoxic at 7.0m; [D.O.] peaked at 4-4.5m (Z_m = 7.5m; A_o = 156,000 m^2; $\bar{Z}$ = 3.2 m; V = 507,000 m^3); 3. RB caught in gill nets; LKC caught in minnow traps; 4. Outlet had poor spawning habitat, but good rearing habitat.
Conclusion(s):	Lake has numerous RB, but they are stunted.
Recommendation(s):	Increase fishing limit to reduce intraspecific competition; alternatively, trap net lake to reduce RB population (stock another lake with trapped fish).
Follow up:	None known
Comments:	No inlet creeks were found.

Report No. 100 Lake Inventory	*A Reconnaissance Survey of Finger Lake* (55°19'52"N, 123°55'34"W; 93 O/5)
Reference systems:	*Finger Lake*, Unnamed Creeks (7 intermittent inlets, 1 outlet)
Sub-basin:	NATION RIVER
Survey date(s):	June 13 and 14, 1990
Objective(s):	To assess the physical, chemical and biological characteristics of Finger Lake and its immediate watershed.
Result(s):	1. Weak thermocline between 5 and 7-m depth (perhaps deeper); 2. Hypoxic at 6.5m; anoxic at 7m (Z_m = 10.5m; A_o = 905,000 m^2; $\bar{Z}$ = 5.9 m; V = 5,300,000 m^3); 3. Fish community comprised of RB and PCC; 4. 42% of RB had stomach or coelomic tapeworms or nodules/cysts; 5. No salmonid spawning habitat observed; rearing habitat marginal; 6. Intermittent inlets had no fisheries potential.
Conclusion(s):	No specific conclusions were given.
Recommendation(s):	1. RB stock assessment in 3 - 5 years (angler pressure expected to increase); 2. If native RB stock declines as a result of increased fishing pressure, occasional stocking should be considered; 3. Should quantify (location and amount) spawning habitat.
Follow up:	None known

Report No. 112 Lake Inventory	***A Reconnaissance Survey of Little Calais Lake*** (55°25'00"N, 125°23'13"W; 93 N/6)
Reference systems:	***Little Calais Lake***, Unnamed Creeks (1 year-round inlet, 2 intermittent inlets and 1 outlet)
Sub-basin:	NATION RIVER
Survey date(s):	June 9 and 10, 1992 (summer) and March 4, 1992 (winter)
Objective(s):	1. To assess the physical, chemical and biological characteristics of Little Calais Lake and its immediate watershed 2. To assess whether the lake can support a GR "refuge" population.
Result(s):	1. Thermally stratified on summer survey date; 2. All summer [D.O.] were > 4mg/L (Z_m = 14.2m; A_o = 156,500 m^2; $\bar{Z}$ = 5.5 m; V = 867,000 m^3); 3. Inversely stratified on winter sampling date; 4. Winter hypoxia at 7-m depth; 5. Gill nets and minnow traps caught 53 coarse fish and 33 LSU; 6. Inlet #1 has moderate to good spawning habitat and moderate rearing habitat; 7. Outlet has good rearing habitat.
Conclusion(s):	Ideal candidate for GR introduction.
Recommendation(s):	None given
Follow up:	Stocked with 62 Nation River GR on July 23, 1992; second stocking was scheduled for July, 1993.

Report No. 142 Lake Inventory	***A Reconnaissance Survey of Unnamed Lake (Profile Lake)*** (55°28'28"N, 125°39'46"W; 93 N/5)
Reference systems:	***Profile Lake***, Unnamed Creeks (4 inlets, 1 outlet)
Sub-basin:	NATION RIVER
Survey date(s):	June 30 and July 1, 1996
Objective(s):	To assess the physical, chemical and biological characteristics of Profile Lake and its immediate watershed.
Result(s):	1. Thermocline between 2 and 5-m depth 2. Hypoxic below 21m; [D.O.] maximum at 4m (Z_m = 29.2 m; A_o = 235,331 m^2; $\bar{Z}$ = 11.4 m; V = 2,597,908 m^3). 3. Gill nets caught whitefish (57% TC), RB (27%) and LNC; minnow traps caught RSC, LKC and sculpins; 4. Inlet #2 and outlet have suitable spawning habitat; inlet #2 has good cover attributes; inlet #1 has good rearing potential, but no spawning potential.
Conclusion(s):	No specific conclusions given.
Recommendation(s):	1. Lake could support a low intensity fishery; 2. Partial openings outlet and/or inlet #2 beaver dams would improve fish access to spawning sites.
Follow up:	None known
Comments:	1. Metals (surface only) and N and P data appended in report; 2. Tsayta Lake Lodge owner claims that LT migrate to and from lake each spring.

Report No. 143 Lake Inventory	***A Reconnaissance Survey of Unnamed Lake (Sylvester Lake West)*** (55°18'18"N, 124°26'08"W, 93 N/8)
Reference systems:	***Sylvester Lake West***, Unnamed Creeks (2 inlets and 1 outlet)
Sub-basin:	NATION RIVER
Survey date(s):	July 9, 1996
Objective(s):	To assess the physical, chemical and biological characteristics of Sylvester Lake West and its immediate watershed.
Result(s):	1. Thermocline between 2 and 5-m depth; 2. Hypoxic at 9.5m and below (Z_m = 11.5m; A_o = 43,237 m^2; $\bar{Z}$ = 3.8 m; V = 165,375 m^3); 3. No fish were caught in gillnets or minnow traps. 4. Outlet has good spawning habitat; however, fish access to spawning habitat restricted by a 6-m underground section.
Conclusion(s):	Ideal stocking candidate (lake barren).
Recommendation(s):	1. Could be stocked with Nation River GR; 2. Outlet could be modified to give fish access to spawning habitat; 3. Could bring in more spawning gravels to add to existing gravels; 4. Should assess winter temperature/oxygen conditions to assess winter kill potential.
Follow up:	None known
Comments:	1. Good location for a Forest Recreation Site; could serve Sylvester Lake East and West; 2. Metals (surface only) and N and P data appended in report.

Report No. 144 Lake Inventory	***A Reconnaissance Survey of Unnamed Lake (Sylvester Lake East)*** (55°18'14"N, 124°25'52"W, 93 N/8)
Reference systems:	***Sylvester Lake East***, Unnamed Creeks (1 inlet and 1 outlet)
Sub-basin:	NATION RIVER
Survey date(s):	July 10, 1996
Objective(s):	To assess the physical, chemical and biological characteristics of Sylvester Lake East and its immediate watershed.
Result(s):	1. Temperature decreased slightly with depth (not stratified); 2. [D.O.] > 4 mg/L through water column (Z_m = 3.1m; A_o = 37,648 m^2; $\bar{Z}$ = 1.0 m; V = 36,050 m^3); 3. No fish caught in gill nets and minnow traps; 4. Inlet has some suitable spawning habitat.
Conclusion(s):	1. Lake is barren. 2. Lake could support a stocked fish population, in terms of food availability.
Recommendation(s):	1. Sylvester Lake East and West could be stocked Nation River GR; 2. Enhance 6-m long subsurface section to permit fish access spawning habitat; 3. Add spawning gravels to inlet; 4. Measure winter temperature/[D.O.] conditions to assess winter kill potential; 5. Good location for a Forest Recreation Site on lakeshore; 6. Caddisflies, damsel flies, mayflies, *Chaoborus* and chironomids numerous;
Follow up:	None known
Comments:	Metals (surface only) and N and P data are appended in report.

Report No. 146 Lake Inventory	***A Reconnaissance Survey of Unnamed Lake (Moose Lake)*** (55°13'12"N, 124°59'24"W, 93 N/2)
Reference systems:	***Moose Lake.*** Unnamed Creeks (2 inlet, 1 outlet)
Sub-basin:	NATION RIVER
Survey date(s):	July 16, 1996
Objective(s):	To assess the physical, chemical and biological characteristics of Moose Lake and its immediate watershed.
Result(s):	1. A weak thermocline between 2.5 and 3.5-m depth; 2. Anoxic and 3.5m and below (Z_m = 5.1 m; A_o = 132,317 m^2; $\bar{Z}$ = 1.7 m; V = 213,778 m^3); 3. Lake supports an RB population; 4. Spawning habitat observed in only one inlet (Inlet #1); inlet may be too shallow for fish to use.
Conclusion(s):	RB were fat (suggests food was plentiful).
Recommendation(s):	1. Could increase depth of inlet #1 (may be too shallow for fish to use); 2. Openning outlet beaver dams may improve fish access to potential spawning habitat.
Follow up:	None known
Comments:	Good lakeshore location for Forest Recreation Site.

Report No. 147 Lake Inventory	***A Reconnaissance Survey of Unnamed Lake (Little MacDonald Lake)*** (55°12'07"N, 125°21'40"W, 93 N/3)
Reference systems:	***Little MacDonald Lake.*** Unnamed Creeks (2 inlets, 1 outlet)
Sub-basin:	NATION RIVER
Survey date(s):	July 17 and 18, 1996
Objective(s):	To assess the physical, chemical and biological characteristics of Little MacDonald Lake and its immediate watershed.
Result(s):	1. Thermocline between 3 and 6-m depth on sampling date; 2. Hypoxic at 5m; anoxic at 8m (Z_m = 9.1m; A_o = 328,880 m^2; $\bar{Z}$ = 3.9 m; V = 1,269,482 m^3); 3. RB dominated fish community; 4. Inlet #2 had good spawning habitat; outlet had some rearing habitat.
Conclusion(s):	RB were numerous; lake could support a moderate use RB fishery.
Recommendation(s):	None given
Follow up:	None known
Comments:	Metals (surface only) and N and P data are appended in report.

Report No. 148 Lake Inventory	***A Reconnaissance Survey of Unnamed Lake (Apostrophe Lake*** (55°14'37"N, 125°16'10"W; 93 N/3, N/6)
Reference systems:	***Apostrophe Lake***, Unnamed Creeks (4 inlets, 1 outlet)
Sub-basin:	NATION RIVER
Survey date(s):	July 18 and 19, 1996
Objective(s):	To assess the physical, chemical and biological characteristics of Apostrophe Lake and its immediate watershed.
Result(s):	1. Isothermal on sampling date; 2. [D.O.] high through water column (Z_m = 6.5m; A_o = 180,989 m^2; $\bar{Z}$ = 1.7 m; V = 294,162 m^3); 3. RB 97% of gill net TC; 4. RB appeared healthy (1 in 30 had tape worms); 5. 275 LKC were caught in four minnow traps; 6. Inlet #1 had some "patches" of spawning habitat; 7. Outlet has spawning habitat; fish movement through outlet may be restricted by beaver dams and woody debris jams.
Conclusion(s):	Lake supports a substantial RB population; could support a low to medium use fishery.
Recommendation(s):	Openning outlet beaver dam could improve fish access to spawning habitat; however, will not necessarily improve present RB population.
Follow up:	None known
Comments:	Metals (surface only) and N and P data are appended in report.

Report No. 160 Lake Inventory	***A Reconnaissance Survey of Unnamed Lake (Fish Hook Lake)*** (55°01'45"N, 123°55'41"W; 93 O/4)
Reference systems:	***Fish Hook Lake***, Unnamed Creek (7 inlets, 1 outlet)
Sub-basin:	NATION RIVER
Survey date(s):	September 5 and 6, 1996
Objective(s):	To assess the physical, chemical and biological characteristics of Fish Hook Lake and its immediate watershed.
Result(s):	1. Weak thermocline between 4 and 5.5-m depth; 2. Anoxic at 5m and below (Z_m = 7.5m; A_o = 104,909 m^2; $\bar{Z}$ = 1.3 m; V = 135,179 m^3); 3. RB (66% TC) and LSU (34%) caught in gill nets; 4. No spawning habitat identified in inlets or outlet; 5. RB looked healthy; 5 of 30 had gill lice.
Conclusion(s):	Lake could support a low use fishery.
Recommendation(s):	None given
Follow up:	None known
Comments:	1. Metals (surface only) and N and P data are appended in report; 2. Good location for a Forest Recreation Site.

Report No. 86 Lake Inventory	***A Reconnaissance Survey of Bruce Lake*** (55°08'29"N, 122°54'49"W; 93 O/2)
Reference systems:	***Bruce Lake***, Unnamed Creeks (1 inlet, 1 outlet)
Sub-basin:	PARSNIP RIVER
Survey date(s):	July 5 and 6, 1989
Objective(s):	To assess the physical, chemical and biological characteristics of Bruce Lake and its immediate watershed.
Result(s):	1. Thermocline between 3 and 6-m depth on sampling date; [D.O.] peaked between 4 and 5m; 2. Hypoxic at 12m and deeper (Z_{eu} = 19m; A_o = 388,000 m^2; $\bar{Z}$ = 9.0 m; V = 3,490,000 m^3); 3. LKC only species caught in gill nets and minnow traps; 4. No spawning habitat identified in inlet or outlet; outlet had marginal rearing habitat, inlet had none.
Conclusion(s):	If initiated, a stocking program would need to be continuous as there is no spawning habitat in the system.
Recommendation(s):	1. RB stocking program recommended; 2. Do not stock EB (species could get into Parsnip River system); 3. Should be managed for a moderate use fishery once road accessible. 4. Outlet beaver dam should be replaced with more permanent structure to restrict in-migration of Williston Lake coarse fish.
Follow up:	1. Stocked on September 18, 1989 with 17,000 YOY Dragon Lake RB; 2. Fish Habitat Enhancement Potential and Stocking Assessment conducted in 1994 (see Report No. 123).

Report No. 97 Lake Inventory	***A Reconnaissance Survey of Windy Point Lake*** (55°06'52"N, 122°58'54"W; 93 O/2)
Reference systems:	***Windy Point Lake***, Unnamed Creek (intermittent inlet)
Sub-basin:	PARSNIP RIVER
Survey date(s):	June 7 and 8, 1989
Objective(s):	To assess the physical, chemical and biological characteristics of Windy Point Lake and its immediate watershed.
Result(s):	1. Thermocline between 3 and 9-m depth on sampling date;. 2. Hypoxic at 11m; anoxic at 12m (Z_{eu} = 16m); 3. Inlet has no fisheries value or potential (intermittent); 4. RB on species caught in gill nets.
Conclusion(s):	None given
Recommendation(s):	Near-shore upwelling facility would encourage fish to spawn; alternatively, an artificial spawning stream could be constructed.
Follow up:	1. An upwelling station was installed in autumn 1992 by the PWFWCP (scheduled for operation in 1993/94); 2. MOF constructed a Forest Recreation Site by the lake (1992).
Comments:	1. Reconnaissance surveys (1961 and 1968) and stocking assessments (1983) have been conducted; 2. Lake stocked has been stocked by BCMELP since 1970.

Report No. 170 Lake Inventory	***A Reconnaissance Survey of Chuyazega Lake*** (54°55'34"N, 122°32'29"W; 93 J/15)
Reference systems:	***Chuyazega Lake***, Chuyazega Creek, Unnamed Creeks (5 inlet, 1 outlet)
Sub-basin:	PARSNIP RIVER
Survey date(s):	October 16 and 17, 1996
Objective(s):	To assess the physical, chemical and biological characteristics of Chuyazega Lake and its immediate watershed.
Result(s):	1. Lake isothermal on survey date; [D.O.] constant through water column (Z_m = 3.6 m; A_o = 323,110 m^2; $\bar{Z}$ = 1.8 m; V = 590,685 m^3); 2. Fish community dominated by RB (58% TC) and coarse CSU (30%); 3. RB seemed health (few stomach worms, none had lice); 4. Inlet and outlet creeks did not have suitable spawning habitat; 5. Excellent spawning habitat Chuyazega Creek (d/s of Chuyazega Lake).
Conclusion(s):	1. RB population could support a moderate-low use fishery; 2. Could establish a Forest Recreation Site on northwest shore if access extended from existing logging road.
Recommendation(s):	No specific recommendations given.
Follow up:	None known
Comments:	Metals data appended in report.

Report No. 171 Lake Inventory	***A Reconnaissance Survey of Chudnuslida Lake*** (54°54'45"N, 122°34'13"W; 93 J/15)
Reference systems:	***Chudnuslida Lake***, Unnamed Creeks (3 inlets, 1 outlet), Chuyazega Creek
Sub-basin:	PARSNIP RIVER
Survey date(s):	October 17 and 18, 1996
Objective(s):	To assess the physical, chemical and biological characteristics of Chudnuslida Lake and its immediate watershed.
Result(s):	6. Thermocline between 11 and 12-m depth on sampling date; 7. Anoxic at 12m and deeper (Z_m = 16.2m; A_o = 510,222 m^2; $\bar{Z}$ = 6.6 m; V = 3,358,249 m^3); 8. LSU (77% TC) and RB (17%) dominated gill net catch; 9. RB seemed healthy(4 of 15 had stomach worms); 10. Outlet had suitable spawning habitat; but, fish movement to habitat impeded by blocked culvert.
Conclusion(s):	Lake could support a low use RB fishery.
Recommendation(s):	Could establish a Forest Recreation Site near the outlet creek; however, a nearby logging road may detract from the aesthetic appeal.
Follow up:	None known
Comments:	4. Metals, N and P data are appended in report; 5. A lake survey was also conducted in September 1976; 6. The partially blocked culvert on outlet has raised lake levels.

Report No. 91 Lake Inventory	*A Reconnaissance Survey of McIntyre Lake* (55°03'29"N, 123°05'06"W; 93 O/3)
Reference systems:	*McIntyre Lake*, Unnamed Creek (outlet)
Sub-basin:	CROOKED-PACK RIVERS
Survey date(s):	June 26 to 28, 1989
Objective(s):	To assess the physical, chemical and biological characteristics of McIntyre Lake and its immediate watershed.
Result(s):	1. Thermocline between 6 and 9-m depth on survey date; 2. Hypoxic at 14 m; anoxic at 17m; (D.O.) peaked at 7m (Z_m = 21m; A_o = 1,050,000 m^2; $\bar{Z}$ = 11.0 m; V = 11,600,000 m^3); 3. Fish community was dominated by NSC (36% TC), CSU (25%) and PCC (23%); RB comprised 7% of gill net catch; 4. Outlet had some spawning habitat.
Conclusion(s):	1. Lake has a distinct shoreline, and little marsh area (good candidate for chemical rehabilitation); 2. Coarse fish may impede the success of any RB stocking program (unless large RB introduced).
Recommendation(s):	No specific recommendations given.
Follow up:	None known
Comments:	Some NSC had blackspot disease.

Report No. 94 Lake Inventory	*A Reconnaissance Survey of Royer Lake* (55°02'31"N, 123°11'17"W; 93 O/3)
Reference systems:	*Royer Lake*, Unnamed Creeks (1 inlet and 1 outlet creek)
Sub-basin:	CROOKED-PACK RIVERS
Survey date(s):	June 29 and 30, 1989
Objective(s):	To assess the physical, chemical and biological characteristics of Royer Lake and its immediate watershed.
Result(s):	1. Thermocline between 3 and 4.5-m depth on survey date; 2. The hypolimnion was hypoxic, and anoxic at 9m (Z_m = 10.5m; A_o = 390,500 m^2); 3. Outlet had potential spawning and rearing habitats from lake mouth to 200m d/s of lake; 4. Fish community was dominated by LKC (60% TC) and MW (19%).
Conclusion(s):	1. Outlet marsh will impede success of any chemical rehabilitation; 2. Stocking with Blackwater RB may be feasible.
Recommendation(s):	If access road and/or stocking program established, add spawning gravels to outlet and remove debris jam at lake-outlet junction.
Follow up:	None known

Report No. 99 Lake Inventory	*A Reconnaissance Survey of Butternut Lake* (50°00'52"N, 123°05'40"W; 93 O/3)
Reference systems:	***Butternut Lake***, Unnamed Creek (outlet)
Sub-basin:	CROOKED-PACK RIVERS
Survey date(s):	June 20 to 22, 1990
Objective(s):	To assess the physical, chemical and biological characteristics of Fish Hook Lake and its immediate watershed.
Result(s):	1. Thermocline between 5 and 8-m depth on survey date; 2. [D.O.] > 4 mg/L through water column; small [D.O.] peak at 2m; region of relatively high [D.O.] between 7.5 and 10m (Z_m = 11.6m; A_o = 355,000 m^2; $\bar{Z}$ = 7.1 m; V = 2,520,000 m^3); 3. LW and LSU caught in the gill net; LKC caught in minnow traps; 4. Outlet had no spawning habitat.
Conclusion(s):	None given
Recommendation(s):	1. Stock lake with RB and manage for a moderate use fishery once road access established; continuous stocking required unless beaver dams removed from outlet creek and spawning gravel introduced; conduct a stock assessment 3 years after initial stocking; 2. Stock with EB (first construct a dam on the outlet to close system); 3. Chemical rehabilitation of lake to develop a monoculture RB fishery.
Follow up:	None known

Report No. 167 Lake Inventory	*A Reconnaissance Survey of Blue Lake* (54°57'41"N, 123°04'52"W; 93 J/14, O/9)
Reference systems:	***Blue Lake***
Sub-basin:	CROOKED-PACK RIVERS
Survey date(s):	October 8 to 9, 1996
Objective(s):	To assess the physical, chemical and biological characteristics of Blue Lake and its immediate watershed.
Result(s):	1. A weak thermocline observed at 12-m depth; hypoxic below 11.5m (Z_m = 15m; A_o = 305,463 m^2; $\bar{Z}$ = 4.8 m; V = 1,453,307 m^3); 2. LSU caught in minnow traps and gill nets.
Conclusion(s):	Lake supports a productive LSU population.
Recommendation(s):	Could be stocked with RB or EB (lake is land-locked); yearly or bi-yearly stocking would be required to maintain populations.
Follow up:	None known
Comments:	1. Lake does not have inlets or an outlet; 2. Metals (surface waters) and N and P data are appended in report.

Report No. 168 Lake Inventory	***A Reconnaissance Survey of Swamp Grass Lake*** (54°58'34"N, 123°17'41"W; 93 J/14)
Reference systems:	***Swamp Grass Lake***, Des Creek (outlet), Unnamed Creek (outlet)
Sub-basin:	CROOKED-PACK RIVERS
Survey date(s):	October 9 and 10, 1996
Objective(s):	To assess the physical, chemical and biological characteristics of Swamp Grass Lake and its immediate watershed.
Result(s):	1. Temperature decreased by 2.3 °C from surface to 6.5-m depth; no thermocline; 2. [D.O.] maximum at surface; hypoxic below 5m (Z_m = 6.9m; A_o = 39,092 m^2; $\bar{Z}$ = 2.1 m; V = 81,813 m^3); 3. No fish were caught in gill net or minnow traps; 4. Inlet and outlet had no fisheries potential.
Conclusion(s):	The lake is barren.
Recommendation(s):	Stocking is not recommended.
Follow up:	None known
Comments:	1. Metals (surface only) and N and P data are appended in report; 2. Poor public access (no logging roads in the vicinity).

Report No. 169 Lake Inventory	***A Reconnaissance Survey of Monk Lake*** (54°56'12"N, 123°15'06"W; 93 J/14)
Reference systems:	***Monk Lake***, Moffet Creek (outlet)
Sub-basin:	CROOKED-PACK RIVERS
Survey date(s):	October 10 and 11, 1996
Objective(s):	To assess the physical, chemical and biological characteristics of Monk Lake and its immediate watershed.
Result(s):	1. Thermocline between 5 and 6-m depth; 2. [D.O.]peaked at 3m; hypoxic between 6 and 7m; anoxic at 7.5m and deeper (Z_m = 13.2m; A_o = 24,518 m^2; $\bar{Z}$ = 4.4 m; V = 106,024 m^3); 3. No fish were caught in gillnets or minnow traps; 4. No spawning habitat was identified in outlet.
Conclusion(s):	Lake is barren.
Recommendation(s):	1. Could be stocked with RB; 2. Add spawning gravel to outlet if stocked.
Follow up:	None known
Comments:	1. Metals (surface only) and N and P data are appended in report; 2. Lake does not have permanent inlets; 3. Numerous aquatic organisms observed (possible salmonid food).

Report No. 102 Lake Inventory	***A Reconnaissance Survey of Wright Lake*** (55°53'39"N, 122°30'23"W; 93 O/15, O/16)
Reference systems:	***Wright Lake***, Gething Creek (outlet), Unnamed Creeks (9 seasonal inlets)
Sub-basin:	DINOSAUR RESERVOIR
Survey date(s):	July 7 and 8, 1990
Objective(s):	To assess the physical, chemical and biological characteristics of Wright Lake and its immediate watershed.
Result(s):	1. Weak thermocline between 4 and 9.5-m depth; 2. Hypoxic at 11m; anoxic at 12m (Z_m = 13m; A_o = 232,000 m^2; $\bar{Z}$ = 6.4 m; V = 1,490,000 m^3); 3. LSU only species caught in gill nets; 4. First 500m of outlet had poor to fair spawning habitat, but fair to good rearing habitat; 5. Inlets had no fisheries potential.
Conclusion(s):	Winter and summer temperature/D.O. conditions suggest that lake may be able to support a stocked RB population.
Recommendation(s):	1. An initial spring stocking of 8,000 (10g) native RB (helicopter); manage for a low to moderate use fishery once trail access established; 2. Monitor stocked RB to ensure that they are surviving (high LSU population); 3. Add spawning gravel to outlet; habitat complexing may help; 4. Could excavate a deeper channel from the main lake and bay/marsh area to outlet so that RB can access outlet during low flow.
Follow up:	None known
Comments:	Detailed N and P data appended in report.

PART B. STREAM AND RIVER INVENTORY

Report No. 59 Stream Inventory	***Finlay River Kokanee*** **(Oncorhynchus nerka)** ***Spawning Survey 1990***
Reference systems:	***Finlay River***
Sub-basin:	FINLAY RIVER
Survey date(s):	October 10 to November 7, 1990
Objective(s):	1. Determine timing of KO spawning and run strength (lower 40km); 2. Describe habitat and map KO distributions; 3. Describe morphological and age structure of Finlay River KO.
Result(s):	1. 6,753 KO were holding in schools in eight sloughs and back channels; 2. Back channels and sloughs were up to 5°C warmer than the mainstem; they did not appear to have suitable spawning gravel; 3. Total KO escapement estimated at 18,000; 4. 81% of sampled KO were male; 98% were three years old; 5. Mean fork length of sampled KO was 302 mm; 6. Average fecundity was 496 eggs; 7. Holding areas froze over before KO matured.
Conclusion(s):	1. Warmer temperatures in back channels and sloughs may have provided a more stable environment for egg incubation than the mainstem river; 2. KO were 1 month away from spawning when the survey ended.
Recommendation(s):	1. Acquire broodstock (collect KO in transitional maturity state maturity and hold until mature); 2. Transfer broodstock adults to inaccessible sloughs; use hatcheries and spawning channels; 3. Study timing of spring zooplankton bloom out-migration of KO fry; temperature at spawning areas; radio-tag KO to identify spawning areas; KO disease analysis; under-ice SCUBA surveys.
Follow up:	Radio-tag survey conducted in 1991 to identify KO spawning areas (see Report No. 63).

Report No. 63 Stream Inventory	***Finlay River Kokanee (*Oncorhynchus nerka*) Spawning Survey 1991***
Reference systems:	***Finlay River***
Sub-basin:	FINLAY RIVER
Survey date(s):	September 19 to 28, 1991 (tagging); September 28, October 7, 20, 29 and November 27, 1991 (tracking)
Objective(s):	1. To describe the migration patterns of Finlay River KO (radio tagging); 2. To Map Finlay River KO spawning areas; 3. To describe morphology and age structure of KO population; 4. To geo-reference KO inventory data (distribution and spawning areas).
Result(s):	1. 36% of captured KO were female; 2. Mean KO fork length was 286 mm; 3. One 2 year old jack captured; all other sampled KO were 3 years old; 4. Average fecundity was 400 eggs; 5. KO were most abundant in the lower reaches; few captured u/s of Deserters Canyon; 6. Most KO moved d/s to the lower reaches immediately after tagging; 7. Tagged KO observed in lower reaches and in Williston Reservoir in October and November (aerial survey).
Conclusion(s):	1. Numerous BT captured in Deserters Canyon (may prey upon KO – this may explain observed movement of "tags" through lower river and reservoir); 2. Tagging/tracking program did not successfully describe KO movements.
Recommendation(s):	None given
Follow up:	None known
Comments:	Data cross-referenced with 1990 KO study (see Report No. 59).

Report No. 80 Stream Inventory	***Finlay River Lake Trout Spawning Investigation***
Reference systems:	***Finlay River***, Fishing Lakes
Sub-basin:	FINLAY RIVER
Survey date(s):	September 1994 (specific dates not given)
Objective(s):	1. Confirm presence of a river-spawning LT population in Finlay River near Fishing Lakes; 2. To capture LT in spawning and/or partially spent conditions.
Result(s):	1. Average water temperature = 7.7 °C; 2. No LT captured in Finlay River (angling and monofilament gill net); 3. Four LT captured in one of the Fishing Lakes (two were partially spent); 4. GR, RB and BT were caught in Finlay River (angling).
Conclusion(s):	1. Individuals who reported spawning LT in river may have actually seen BT (possible misidentification); 2. More survey work required before presence of river-spawning LT confirmed.
Recommendation(s):	None given
Follow up:	None known
Comments:	Rainfall and associated high water levels/velocities hampered gill netting.

Report No. 64 Stream Inventory	***Bull Trout (*Salvelinus confluentus*) Survey in Scott Creek and Weston Creek Conducted by the Lheit-Lit'en Nation. August to September 1991.***
Reference systems:	***Scott Creek, Weston Creek***
Sub-basin:	WILLISTON RESERVOIR RESIDUAL
Survey date(s):	August 9 to September 13, 1991
Objective(s):	1. Expand knowledge of BT life history; 2. Fence construction on Scott and Weston creeks to capture u/s and d/s BT migrations; 3. To determine timing of BT migration and fish numbers; describe BT morph structure; 4. To describe juvenile BT distributions.
Result(s):	1. In first three weeks, 5 BT were caught in Scott Creek and 1 Weston Creek (moving u/s); 2. Scott Creek BT began d/s migration on September 7; 3. 51 d/s-migrating BT were caught in Scott Creek in the last study week; 4. 3 dead (unspawned) BT at Weston Creek fence following 6-day high flow period; no d/s-migrating BT caught in Weston Creek; 5. Sampled (8 only) BT were between 7 and 10 years old; 6. Scott Creek is larger and more stable than Weston Creek; 7. Scott Creek substrates dominated by boulder and cobble (primarily riffle habitat); Weston Creek's by fines (high proportion of glides); 8. Juvenile RB and BT captured in both systems.
Conclusion(s):	1. BT move u/s to spawn by the end of the first week of August; 2. Spawning takes place in late August and spent fish start d/s movements at the end of the first week of September.
Recommendation(s):	Further study required further quantify size and timing of BT spawning runs.
Follow up:	None known

Report No. 172 Stream Inventory	*Fish Trapping Operation on Dunlevy Creek, 1995*
Reference systems:	*Dunlevy Creek*
Sub-basin:	PEACE REACH
Survey date(s):	May 9 to October 30, 1995
Objective(s):	1. Species-specific enumeration; 2. Describe fish movements in and out of Dunlevy Creek; 3. Evaluate stocked KO and RB return rates.
Result(s):	1. TC over 6 month trapping operation: 14, 809 suckers; 10, 862 LKC; 1,180 whitefish; 960 RB ($\bar{X}$ FL = 274 mm, $\bar{X}$ weight = 228 g); 270 BT ($\bar{X}$ FL = 287 mm, $\bar{X}$ weight = 218 g); 104 KO ($\bar{X}$ FL = 297 mm, $\bar{X}$ weight = 248 g); 59 sculpins, 8 NSC; 1 BB; 2. Most BT were 3 years old; RB 4 years old; 3. Survival of stocked KO fry to spawning adult stage was 0.4%; 4. Four of 964 captured RB were of hatchery origin; 5. Spawning RB spent an average of 21 d in creek before migrating back to reservoir; 6. BT use creek exclusively for summer feeding.
Conclusion(s):	No specific conclusions given
Recommendation(s):	Recruitment of juvenile salmonids to adult stage not quantified.
Follow up:	None known
Comments:	1. RB stocked in 1990 and 1991; KO stocked1990-95; 2. Report also categorized as ENHANCEMENT EVALUATION.

Report No. 76 Stream Inventory	***Summary of the 1994 Fish Trapping Operations on Suschona and Sylvester Creeks***
Reference systems:	***Suschona Creek***, Sylvester Creek
Sub-basin:	NATION RIVER
Survey date(s):	May 19 to June 14, 1994 (Suschona Creek) and May 28 to June 24, 1994 (Sylvester Creek)
Objective(s):	To describe the life histories of Nation River GR and other species.
Result(s):	**Suschona Creek:** *1.* 428 RB, 101 MW, 15 LSU, 3 LNC and 1 BT captured at fence; *2.* RB length-frequency of u/s- and d/s-migrating fish similar; *3.* A "dwarf RB" morph present (scale analysis); *4.* U/S migrating MW were "large"; d/s migrating MW were small; *5.* Average water temperature = 9.3°C for study period. **Sylvester Creek:** *6.* 64 RB, 116 MW, 107 LNC, 8 BT, 5 NSC and 4 BB caught at fence; *7.* 75% of RB were captured during d/s migration, 25% during d/s; *8.* RB length-frequency of u/s- and d/s-migrating fish similar; *9.* Average water temperature = 5.9°C; *10.* Two RB morphs observed: (1) a "dwarf" stream resident; and (2) a larger Nation River population.
Conclusion(s):	*1.* No GR observed in either creek; *2.* At least two RB populations coexist; *3.* MW abundant in both systems; *4.* LNC were abundant in Sylvester Creek, but not Suschona Creek.
Recommendation(s):	Study dynamics of Nation River GR.
Follow up:	None known
Comments:	Numerous GR (> 50/km) were found d/s of Sylvester Creek mouth in July 1993, suggesting that creek may be important to GR during some life stage.

Report No. 173 Stream Inventory	*Fish Species Presence and Abundance of the Table River, 1995*
Reference systems:	*Parsnip River*
Sub-basin:	PARSNIP RIVER
Survey date(s):	July to September, 1995
Objective(s):	To describe the Table River fish community in terms of species composition and abundance (angling, electrofishing, snorkel surveys).
Result(s):	1. GR, BT, BB, dace, NSC, RB, sculpins, suckers and whitefish present; 2. 189 GR angled (66% TC); 964 fish electrofished (sculpins = 70% TC); 3. 3,624 fish observed during single-pass snorkel survey of 23.5-km river distance (MW = 73% of total fish observed); 4. 251 GR occupied section from 35.5 to 32-km u/s mouth (mark recapture); 5. Obstructions exist at 37.6, 42.7 and 54.0-km u/s mouth; 6. BT only species observed 54-km u/s mouth. 7. GR only observed in mainstem (i.e., never observed in tributaries);
Conclusion(s):	None given
Recommendation(s):	Further studies should be undertaken to determine habitat preference and distribution of GR and other Table River species .
Follow up:	GR radio-tracking program initiated in 1996 (reports not currently available);
Comments:	Table River surveys summarized in Report Nos. 178 and 180.

Report No. 178 Stream Inventory	*A Reconnaissance Survey of the Table River: 1995 Status Report*
Reference systems:	*Table River*
Sub-basin:	PARSNIP RIVER
Survey date(s):	June 8 to October 15, 1995
Objective(s):	1. Describe life histories of Table River fish and their habitat requirements; 2. To identify fish-limiting conditions and effects of human activities; 3. To describe enhancement options for Table River.
Result(s):	1. There are "areas of concern" on mainstem Table River and its tributaries (e.g., slumping or failing banks and beaver activity); 2. Effects of logging activity on fish habitat described; 3. Table River temperatures were generally 1.5°C > four comparison sites (upper Table River and 3 tributaries); 4. Seasonal water temperature changes were identical at all sites;
Conclusion(s):	1. Adult and sub-adult GR were most often observed in small pools or glides that had some LWD; 2. GR located at sites were water depth ranged from 70 - 260cm; 3. GR size increased with increasing u/s distance; 4. GR were most abundant in the upper reaches of mainstem; 5. GR fry inhabited shallow shore margins.
Recommendation(s):	1. Use radio-telemetry to describe adult GR spawning areas, feeding and over-wintering habitat; 2. Genetic studies to segregate Table River GR stocks.
Follow up:	The two recommended studies listed above were initiated in 1997 (reports not yet available).
Comments:	1. See related information in Report Nos. 173 and 180. 2. This study is also categorized as PLANNING.

Report No. 180 Stream Inventory	***A Summary Report of the Table River Surveys, 1996 Status Report***
Reference systems:	***Table River***
Sub-basin:	PARSNIP RIVER
Survey date(s):	June 19 to November 6, 1996
Objective(s):	1. Describe life histories of Table River fish populations; 2. To identify fish-limiting conditions and effects of human activities; 3. To describe enhancement options for Table River.
Result(s):	1. Mean water temperature of upper Table River was 1.2°C cooler than that of lower Table River; 2. The 1996 survey identified the same species as the 1995 survey; with the exception of NSC, which were caught in 1995, but not in 1996 (See Report Nos. 173 and 178). 3. As determined by electrofishing surveys of the mainstem and its tributaries, juvenile BT were the most abundant species; in contrast, snorkel surveys suggest that MW (3,636) and GR (191) were most abundant; 4. Highest fish densities were observed 29 to 28-km u/s of mouth; 5. In terms of length-at-age, Table River GR are similar to Anzac River GR for ages 3-4 and age 6; however, age 5 Table River GR were significantly smaller than age 5 Anzac River GR; 6. The Table River and its tributaries were rated as "poor" in terms of pool habitat; fair to good in terms of LWD cover (mainstem reaches); 7. 52% of all observed GR in glides, 36% in pools and 12% in runs; 8. GR were generally found in habitats over cobbles or gravels; 9. GR often utilize depth (59%) and turbulence (21%) as cover.
Conclusion(s):	None given
Recommendation(s):	17 tributary and 2 mainstem sites identified for potential enhancement (e.g., obstructions, eroding or slumping banks, degraded riparian plant communities and associated in-stream habitat.
Follow up:	GR telemetry and genetics studies were initiated in 1997 (reports not yet available).
Comments:	1. See related information in Report Nos. 173 and 178; 2. Results cross-referenced with two 1995 Table River reports; 3. Report also categorized as PLANNING.

Report No. 140 Stream Inventory	***A Reconnaissance Survey of Gaylard Creek and Bull Trout Habitat Suitability, 1994***
Reference systems:	***Gaylard Creek***, Gething Creek, Unnamed tributary #1
Sub-basin:	DINOSAUR RESERVOIR
Survey date(s):	July 9 to October 17, 1994
Objective(s):	1. Assess Gaylard Creek fish habitat in terms of a potential BT transplant; 2. To describe any fish barriers in Gaylard Creek; 3. Describe Gaylard Creeks fish community.
Result(s):	1. Mean water temperature during the sampling period was 8.9 °C, with maximum temperatures occurring in August; 2. One juvenile RB caught (electrofishing at four sites); 3. Numerous redds observed at one site (probably RB); 4. Four of six reaches had adequate BT spawning habitat; 5. In five of six reaches, in-stream and overhead cover habitat components were not suitable for BT; 6. Gaylard Creek could support an adult "stream resident" BT population, however, minimal holding and rearing habitat available (few deep pools).
Conclusion(s):	1. Numerous fish barriers observed in Reach 1 (construction of a fish passage not feasible); 2. Gaylard Creek could support a BT population, but it would be necessary to transport adults past the falls in Reach 1 (u/s to spawning habitat and back d/s after spawning).
Recommendation(s):	1. Add debris catchers, boulders and pools to increase carrying capacity; 2. If stocked with BT, angling closures and restrictions should be enforced until population is self-sustaining.
Follow up:	None known
Comments:	1. BCMELP stocked Gaylard Creek with RB in 1983; 2. Had planned to measure water temperatures during winter 1994/95; 3. This study also falls into the PLANNING category.

Report No. 62 Stream Inventory	***Williston Watershed Aerial Kokanee (*Oncorhynchus nerka*) Spawning Survey 1990***
Reference systems:	Parsnip, Nation, Manson, Osilinka, Omineca, Finlay, Akie, Ingenika, Ospika, Davis, Bruin, Mesilinka, Clearwater, Nabesche, Schooler, Carbon, Pack and Factor Ross rivers/creeks
Sub-basin:	MULTI-BASIN (Parsnip, Nation, Manson, Osilinka, Omineca, Finlay, Ingenika, Ospika, Residual, Peace Reach and Crooked-Pack sub-basins)
Survey date(s):	October 16 to November 1, 1990
Objective(s):	Determine timing and distribution of spawning KO and numbers of spawning KO and to describe KO spawning habitat (aerial survey of 18 reservoir tributaries.
Result(s):	1. About 10,300 KO were observed at 8 locations (Finlay River side channels and mainstem); 2. KO most often observed in side channel pools having no flow and depths of 1 to 2m; 3. No spawning KO observed, but test redds were present; some digging behavior observed at one location; 4. KO not observed outside of Finlay River basin.
Conclusion(s):	Spawning may have occurred following survey (i.e., cool weather may have slowed maturation).
Recommendation(s):	1. Should collect baseline KO data for Williston Watershed; 2. Telemetry study to assess spawning timing and distribution of Finlay River KO; SCUBA survey to examine condition of KO; 3. Could involve public with KO studies (gather information from fishers);
Follow up:	None known

Report No. 66 Stream Inventory	***Stream Fertilization Feasibility Study: 1991 Data Report***
Reference systems:	Mesilinka (plus Prospector Creek), Osilinka (plus Dead Bear Creek), Carbon, Manson, Misinchinka and Nation rivers
Sub-basin:	MULTI-BASIN (Mesilinka, Osilinka, Peace Reach, Manson, Parsnip and Nation sub-basins).
Assessment date(s):	July to October 1991
Objective(s):	Summarize temperature/chemistry data for six Williston Watershed rivers.
Information in report:	1. Chemistry results include data on pH, alkalinity, TN, $NO_3 + NO_2$, TP and ortho-P; 2. Mean monthly temperature (July to October) and mean, maximum and minimum daily temperatures (in tabular and graphical formats).
Follow up:	Mesilinka River fertilization experiment (see Report No. 85).
Comments:	1. No formal results, conclusions or recommendations given (data report to compare chemical and temperature conditions of several rivers); 2. This report also categorized as PLANNING.

Report No. 70 Stream Inventory	*Fisheries Resources and Enhancement Potentials of Selected Tributaries of the Williston Reservoir, Volume II*
Reference systems:	Akie, Blackwater, Bruin, Carbon, Carmella (alias), Chichouyenily, Chowika, Clearwater, Collins, Cutthumb, Davis, Donna, Dresser, Ducette, Dunlevy, Emerslund, Gaffney, Lafferty, McAllister, Macoun, Manson, Mesilinka, Misinchinka, Mugaha, Nabesche, Nation, Pesika, Philip, Schooler, Scott, Sixmile, Weston and Winn (alias) rivers/creeks
Sub-basin:	MULTI-BASIN (Finlay, Residual, Mesilinka, Peace Reach, Manson, Nation, and Parsnip sub-basins)
Assessment date(s):	1993 (report date)
Objective(s):	Summarize available data on 34 Williston Watershed streams.
Information in report:	1. A map of each stream. 2. Biophysical data (e.g., measurements and/or descriptions of length, wetted/channel widths, spawning habitat, mean/maximum depths, substrate diameter, gradient, and instream/overstream cover); 3. Electrofishing and snorkel survey data. 4. Aging data (scale analysis).
Follow up:	None known
Comments:	1. No formal results, conclusions, recommendations given (data summary); 2. This report also categorized as PLANNING.

Report Nos. 74, 75, 79, 83, 84, and 127 Stream Inventory	*Water Temperatures of the Nation and Mesilinka River Systems, 1992-1997*
Reference systems:	Nation and Mesilinka rivers
Sub-basin:	MULTI-BASIN (Nation and Mesilinka sub-basins)
Enhancement date(s):	1994-ongoing?
Objective(s) of enhancement work:	To stimulate fish production in the Mesilinka River with inorganic nutrient additions (bottom-up stimulation).
Assessment(s) prior to enhancement work:	1. Pre-fertilization temperature data in Report Nos. 74 and 75; 2. Mesilinka River Pre-fertilization Progress Report (Report No. 82).
Enhancement(s) performed:	P and N additions to two reaches of Mesilinka River (using upper Mesilinka Nation River as controls).
Information in reports:	Each report documents one season (mid-June to mid- August or mid-September) of temperature data (daily mean, maximum and minimum reported in graphical and tabular formats).
Comments:	1. No conclusions or recommendations given; 2. These reports also categorized as ENHANCEMENT PROJECT.

PART C. PLANNING

Report No. 69 Planning	***Embayment Enhancement Feasibility Study Williston Reservoir***
Reference systems:	Embayment areas of Williston Reservoir
Sub-basin:	WILLISTON RESERVOIR RESIDUAL
Assessment date(s):	1993
Objective(s):	To evaluate enhancement options for Williston Reservoir embayment areas by means of a literature review and interviews with individuals that make use of the reservoir (researchers, fishers, industrialists, etc.).
Result(s):	The report details a number of potential enhancement techniques: (1) revegetating draw-down zones; (2) artificial reefs, substrates and structures; (3) fertilization; (4) fish stocking; (5) tributary improvements; and (6) cove culture.
Conclusion(s):	1. None of the documents reviewed discussed proven enhancement techniques for northern reservoirs with large draw-downs; 2. Should revegetate littoral zone to provide fish forage and cover (need to assess various planting techniques and utilize species that can tolerate alternating dry and submerged periods); 3. Dyked bays could create productive fish habitat in draw-down zone; 4. Habitat complexes could be experimented with (may benefit RB and BT); 5. Fertilization may stimulate fish production (particularly KO and RB);
Recommendation(s):	1. Develop a small-scale experimental program to assess potential of various enhancement options; 2. Examine dyking potential of Mugaha, Tony and Tutu creek embayments and other Parsnip Reach embayments; 3. Undertake a trial planting project to test plant survivorship and a suite of planting techniques (littoral zone).
Follow up:	None known

Report No. 117 Planning	***Fish Habitat Enhancement Potential and Stocking Assessment of Dina Lake (#1)*** (55°31'35"N, 123°18'30"W; 93 O/11)
Reference systems:	***Dina Lake (#1)***, Unnamed Creeks (1 year-round inlet and 2 intermittent inlets)
Sub-basin:	WILLISTON RESERVOIR RESIDUAL
Assessment date(s):	June 8 and 9, 1991
Objective(s):	To identify potential fisheries enhancement projects.
Result(s):	1. Dina Lake #1 supports stocked RB and EB, and RSC and LSU; 2. Inlet #1 has moderate spawning and rearing habitats; 3. Beaver dams have blocked access to available spawning habitat.
Conclusion(s):	No specific conclusions given.
Recommendation(s):	Several inlet enhancement options were identified: (1) Openning beaver dams; (2) construction of coarse fish barriers; (3) remove silt and sand from spawning areas; (4) habitat complexing; (5) addition of spawning gravels; (6) rip-rap stabilization and channel reformation; (7) make necessary modifications to coarse fish barriers; and (8) trail construction (#'s 1-4 to be implemented in 1992 and #'s 5-8 in 1993).
Follow up:	None known
Comments:	1. BCMELP surveyed of Dina Lake #1 in 1979 and 1983; 2. D A. Jesson has compiled a management plan for all Dina lakes; 3. Lake has a Forest Recreation Site; 4. Report also categorized as ENHANCEMENT EVALUATION.

Report No. 118 Planning	*Fish Habitat Enhancement Potential and Stocking Assessment of Dina Lake (#2)* (55°32'12"N, 123°17'36"W; 93 O/11)
Reference systems:	*Dina Lake #2*, Unnamed Creeks (1 intermittent inlet and 1 outlet)
Sub-basin:	WILLISTON RESERVOIR RESIDUAL
Assessment date(s):	June 20 and 21, 1991
Objective(s):	To identify potential fisheries enhancement projects.
Result(s):	1. Lake supports EB (stocked), LSU and LKC; 2. Inlet has no fisheries potential; 3. Outlet had moderate spawning and rearing habitats d/s of several beaver dams (dams may restrict fish movements to and from lake).
Conclusion(s):	No specific conclusions given.
Recommendation(s):	1. Lower 350m of outlet scheduled for enhancement in 1992-93 (see "A Fisheries Evaluation of Dina Lake #1", located in Regional Lake Inventory Files, BCMELP, Prince George); 2. Beaver dam removal and habitat complexing of upper 200m of outlet.
Follow up:	None known
Comments:	1. BCMELP surveyed lake in June 1970 and in 1977; 2. D.A. Jesson has compiled a management plan for all Dina lakes; 3. Report also categorized as ENHANCEMENT EVALUATION.

Report No. 119 Planning	*Fish Habitat Enhancement Potential and Stocking Assessment of Gantahaz Lake* (55°22'50"N, 123°08'40"W; 93 O/6)
Reference systems:	*Gantahaz Lake*, no inlets or outlets
Sub-basin:	WILLISTON RESERVOIR RESIDUAL
Assessment date(s):	June 21 and 22, 1991
Objective(s):	To identify potential fisheries enhancement projects.
Result(s):	1. EB and LW caught in gill nets; LKC caught in minnow traps; 2. Lake has no inlets or outlets; anglers report that EB attempt to spawn in near-shore gravels and at the boat launch.
Conclusion(s):	No specific conclusions given.
Recommendation(s):	Gravel additions to boat launch area.
Follow up:	About 60 cubic yards of ¾ inch, washed, no-fracture, gravel was placed in and around boat launch area on October 10, 1992.
Comments:	1. BCMELP surveyed lake in August, 1970; 2. Report also categorized as ENHANCEMENT EVALUATION.

Report No. 122 Planning	*Fish Habitat Enhancement Potential and Stocking Assessment of **Morfee Lake*** (55°21'12"N, 123°04'20"W; 93 O/6)
Reference systems:	***Morfee Lake***, Morfee Creek (outlet), Unnamed Creeks (3 intermittent inlets)
Sub-basin:	WILLISTON RESERVOIR RESIDUAL
Assessment date(s):	June 10 and 11, 1991
Objective(s):	To identify potential fisheries enhancement projects.
Result(s):	1. CSU (27% TC), MW (22%), RB (20%) and PCC (11%) dominated fish community; 2. RB seemed healthy (stomach tapeworms observed in two RB, coelomic tapeworms in four); 3. One inlet had moderate spawning substrate and good rearing habitat; 4. Outlet had good spawning habitat upstream-most 40 m and excellent rearing habitat further d/s; 5. Salmonids and coarse fish observed in outlet.
Conclusion(s):	No specific conclusions given.
Recommendation(s):	1. Stabilize outlet banks d/s of first bridge; 2. Survey outlet and Morfee Creek for spawning use and enhancement potential.
Follow up:	None known.
Comments:	1. Lake stocked with RB since 1976; with LT in 1978; 2. Report also classified as ENHANCEMENT EVALUATION.

Report No. 124 Planning	*Fish Habitat Enhancement Potential and Stocking Assessment of **Canty Lake*** (55°57'21"N, 123°42'23"W; 93 O/13)
Reference systems:	***Canty Lake***, Unnamed Creeks (3 inlets), Canty Creek (outlet)
Sub-basin:	WILLISTON RESERVOIR RESIDUAL
Assessment date(s):	October 6 and 7, 1994
Objective(s):	To identify potential fisheries enhancement projects.
Result(s):	1. RB only species caught in gill nets; 2. U/S-most 100m of Canty Creek (outlet) had fair to good salmonid spawning and rearing habitats; 3. Beaver dam at lake mouth restricts fish movements.
Conclusion(s):	No specific conclusions given.
Recommendation(s):	Enhancement options include: (1) remove beaver dam at lake mouth (only if local landowner agrees - landowner concerned that beaver dam removal will affect drinking water quality); (2) beaver fencing; and (3) habitat complexing.
Follow up:	None known.
Comments:	1. Lake surveyed by PWFWCP (see Report No. 87); 2. Report also categorized as ENHANCEMENT EVALUATION.

Report No. 81 Planning	***Carbon Creek Spawning/Rearing Channel Preliminary Design***
Reference systems:	***Carbon Creek***
Sub-basin:	PEACE REACH
Assessment date(s):	April, 1995
Objective(s):	To produce a preliminary design for the Carbon Creek spawning channel.
Conclusion(s):	1. Side channel (for spawning) could be fed by groundwater seepage; 2. Over-bank flood events will occur about every two years.
Proposed work:	1. Create spawning areas at u/s end of side channel, and rearing areas mixed with small pockets of gravel at d/s end; 2. Screen coarse material excavated during construction, and replace appropriate sized spawning gravel (may need to bring in gravels); 3. Construct a 1-1.5 m high x 3 m wide x 600 m long berm to protect channel from inundation.
Recommendation(s):	1. Soil mechanic should visit site during freshet to recommend a gravel-type; 2. Construct channel during low flow (August to September); 3. Channel construction should completed in one season; 4. Channel condition and fish utilization should be monitored.
Follow up:	None known
Comments:	Report cross-references several other reports relevant to project.

Report No. 120 Planning	*Fisheries Habitat Enhancement Potential and Stocking Assessment of* ***Lower Manson Lake*** (55°35'32"N, 124°20'20"W; 93 N/9)
Reference systems:	***Lower Manson Lake***, Manson River (inlet), Boulder Creek (inlet), Unnamed Creek (inlet), Manson River (outlet)
Sub-basin:	MANSON RIVER
Assessment date(s):	July 6 and 7, 1991
Objective(s):	To identify potential fisheries enhancement projects.
Result(s):	1. Lower Manson Lake's fish community dominated by RB (22% TC), PCC (20%), MW (17%) and LSU (11%); 2. LT, BT, LW, PW, CSU, sculpin, and NSC < 10% TC combined; 3. Inlets and outlet had good spawning and rearing habitats.
Conclusion(s):	RB population sparse (low numbers may be a function of small littoral area);
Recommendation(s):	1. No physical enhancements necessary; 2. Continue monitoring of wild stocks; 3. Manson River KO (stocked in 1990) may be able to enter lake (should monitor).
Follow up:	None known
Comments:	1. BCMELP surveyed Lower Manson Lake in August, 1979; 2. Upper Manson Lake Forest Recreation Site serves Lower Manson Lake.

Report No. 121 Planning	*Fisheries Habitat Enhancement Potential and Stocking Assessment of* ***Upper Manson Lake*** (55°39'00"N, 124°22'40"W; 93 N/9)
Reference systems:	***Upper Manson Lake***, Manson River (inlet), Unnamed Channel (between 2 basins of Upper Manson Lake), Manson River (outlet)
Sub-basin:	MANSON RIVER
Assessment date(s):	July 4 and 5, 1991
Objective(s):	To identify potential fisheries enhancement projects.
Result(s):	1. Upper Manson Lake supports MW (21% TC), RB (20%), PW (10%) and CSU populations (10%); 2. LT, BT, LW, PCC and LSU < 10% TC combined; 3. Unnamed Channel had moderate spawning and rearing habitats; 4. Numerous redds observed in Unnamed Channel. 5. Manson River (inlet and outlet) had some spawning habitat and good rearing habitat.
Conclusion(s):	Upper Manson Lake has a small littoral zone (perhaps reason why RB population was sparse).
Recommendation(s):	1. No physical enhancements necessary; 2. Continue monitoring native sport fish stocks; 3. Manson River KO (stocked in 1990) may be able to enter lake (monitor);
Follow up:	None known
Comments:	1. BCMELP surveyed Upper Manson Lake in August, 1979; 2. Forest Recreation Site located on east shore.

Report No. 116 Planning	*Fish Habitat Enhancement Potential and Stocking Assessment of Burden Lake* (55°30'30"N, 123°33'12"W; 93 O/12, O/5)
Reference systems:	***Burden Lake***, Unnamed Creek (1 outlet)
Sub-basin:	NATION RIVER
Assessment date(s):	June 24 and 25, 1991
Objective(s):	To identify potential fisheries enhancement projects.
Result(s):	1. Gill nets caught primarily LSU (77% TC) and RB (21%); 2. Minnow traps caught LKC primarily (93%); 3. Outlet had marginal salmonid habitat and good rearing habitat, but beaver dams may restrict fish movements.
Conclusion(s):	No specific conclusions given.
Recommendation(s):	No physical enhancements required.
Follow up:	None known
Comments:	1. BCMELP surveyed lake in 1983; 2. Lake has a Forest Recreation Site; 3. Report also categorized as ENHANCEMENT EVALUATION.

Report No. 123 Planning	*Fish Habitat Enhancement Potential and Stocking Assessment of Bruce Lake* (55°08'29"N, 122°54'49"W; 93 O/2)
Reference systems:	*Bruce Lake*, Unnamed Creeks (1 inlet, 1 outlet)
Sub-basin:	PARSNIP RIVER
Assessment date(s):	October 3 and 5, 1994
Objective(s):	To identify potential fisheries enhancement projects.
Result(s):	1. Outlet has no spawning habitat and poor rearing habitat; 2. Four beaver dams on outlet obstruct fish movements; 3. Outlet bottom substrates have a high percentage of silts and organics;
Conclusion(s):	Autumn flows in outlet will not support BT spawning and recruitment.
Recommendation(s):	1. Enhance u/s-most 225m of outlet if June flows are adequate; 2. Beaver dam removal (and perhaps beaver fencing), gravel addition and habitat complexing may stimulate RB population; 3. Will need to improve access if enhancement project initiated.
Follow up:	Lake stocked with BT fingerlings in 1995 (should be stocked every 2nd year to sustain low to moderate fishery).
Comments:	1. Bruce Lake was surveyed in July, 1989 (see Report No. 86); 2. Report also classified as ENHANCEMENT EVALUATION.

Report No. 178 Planning	*A Reconnaissance Survey of the Table River: 1995 Status Report*
Reference systems:	*Table River*
Sub-basin:	PARSNIP RIVER
Assessment date(s):	June 8 to October 15, 1995
Objective(s):	1. Describe life histories of Table River fish and their habitat requirements; 2. To identify fish-limiting conditions and human effects on fisheries; 3. To describe fish management options.
Result(s):	1. Concerns on mainstem and tributaries include slumping or failing banks and beaver activity; 2. Effects of logging operations described; 3. Lower Table River temperatures were generally 1.5°C > than those of upper Table River and tributaries; at 4 other sites; seasonal temperature changes were similar at each locale.
Conclusion(s):	1. Adult and sub-adult GR were most often observed in small pools or glides containing LWD; 2. GR were observed at depths between 70 and 260 cm; 3. GR size appeared to increase with increasing u/s distance; 4. GR were most numerous in the upper reaches of the mainstem; 5. GR fry inhabited shallow shore margins.
Recommendation(s):	1. Telemetry project to describe adult GR spawning, feeding and overwintering habitat locations; 2. Genetically describe Table River GR stocks.
Follow up:	Two recommendations (above) were initiated in 1997 (reports not yet available)
Comments:	1. "Fish Species in the Table River, 1995" (Report No. 173) and "Table River Surveys, 1996 (Report No. 180); 2. This study is also categorized as INVENTORY.

Report No. 180 Planning	***A Summary Report of the Table River Surveys, 1996 Status Report***
Reference systems:	***Table River***
Sub-basin:	PARSNIP RIVER
Assessment date(s):	June 19 and November 6, 1996
Objective(s):	1. Describe life histories of Table River fish and their habitat requirements; 2. To identify fish-limiting conditions and human effects on fisheries; 3. To describe fish management options.
Result(s):	1. On average, Upper Table River temperatures were 1.2 °C cooler than those of Lower Table River; 2. 1996 and 1995 surveys identified the same fish species, with the exception of NSC, which were observed in 1995, but not in 1996 (see Report Nos. 173 and 178); 3. As determined by electrofishing effort, BT juveniles were the most abundant fish; by comparison, snorkel surveys suggested that MW (3,636 observed) and GR (191 observed) were dominant; 4. Fish were most abundant between km 29 and km 28 (u/s mouth); 5. Table River and Anzac River GR had similar length-at-age for ages 3-4 and 6; age 5 Table River GR were smaller than age 5 Anzac River GR; 6. Few pools in mainstem Table River and tributaries; mainstem had fair to good LWD cover; 7. GR observed primarily glides (52%), pools (36%) and runs (12.3%) and in waters overlying cobble or gravel substrates; GR appeared to use deep water (59%) and turbulence (21%) as cover.
Conclusion(s):	None given
Recommendation(s):	Investigate restoration potential of 17 Table River tributaries (see report) and two mainstem sites (assess problems caused by beaver dams, culverts, eroding or slumping stream banks and riparian vegetation loss).
Follow up:	GR telemetry and genetics programs initiated in 1997.
Comments:	1. "Fish Species in the Table River, 1996" (Report No. 173) and "A Reconnaissance Survey of the Table River, 1996" (Report No. 178); 2. Results cross-referenced with two 1995 Table River reports; 3. Report also categorized as INVENTORY.

Report No. 115 Planning	*Fisheries Habitat Enhancement Potential and Stocking Assessment of Sabai Lake*
Reference systems:	*Sabai Lake*, Unnamed Creeks (1 inlet, 1 outlet)
Sub-basin:	CROOKED-PACK RIVERS
Assessment date(s):	May 31, June 1 and August 24, 1990
Objective(s):	To identify potential fisheries enhancement projects.
Result(s):	1. Gill nets caught suckers, RSC and one RB; 2. Outlet has no spawning potential (obstructed by two beaver dams); 3. Inlet has sparse spawning habitat, but some rearing habitat.
Conclusion(s):	1. Lake has few sport fish; 2. Outlet has no enhancement potential; inlet has some potential.
Recommendation(s):	1. Stocking with native RB (initially 10,000 fish) and manage for a moderate use fishery; 2. Assess stocking success three years after initial transplant; 3. Measure winter oxygen/temperature conditions before stocking; 4. Add gravel and open beaver dams to improve inlet spawning potential.
Follow up:	None known
Comments:	1. BCMELP surveyed lake in 1987; 2. Lake has a Forest Recreation Site.

Report No. 72 Planning	***Fisheries Enhancement Options for Dinosaur Lake - A Review***
Reference systems:	***Dinosaur Reservoir***, Johnson Creek, Gething Creek
Sub-basin:	DINOSAUR RESERVOIR
Assessment date(s):	February, 1993
Objective(s):	Assess fisheries enhancement potential of Dinosaur Reservoir and its tributaries.
Result(s):	1. RB is predominant sportfish (lake stocked annually with hatchery RB); 2. Growth rates of wild and hatchery RB are good, but spawning success and survival are low; 3. RB spawn in Johnson Creek; BT principally in Gething Creek.
Conclusion(s):	Low RB survival attributed to lack of suitable rearing habitat, and entrainment out of system.
Recommendation(s):	1. Reduce entrainment by pen-rearing hatchery fish; 2. Create of rearing habitat in reservoir (e.g., artificial structures); 3. Enhance spawning areas or create artificial spawning channels.
Follow up:	None known

Report No. 56 Planning	***Spawning and Rearing Habitat Assessment of Williston Reservoir Tributaries***
Reference systems:	Akie, Bernard, Blackwater, Carbon, Chowika, Clearwater, Collins, Cutthumb, Davis, Ducette, Dunlevy, Eklund, Emerslund, Factor Ross, Gaffney, Ingenika, Kimta, Lafferty, Lignite, Lost Cabin, Manson, McDougall, Mesilinka, Misinchinka, Mugaha, Nabesche, Nation, Ole, Pack, Pardonet, Pelly, Pesika, Philip, Point, Police, Russel, Schooler, Scott, Scovil, Selwyn, Sixmile, Stelkuz, Strandberg, Swannell, Teare, Tony, Tsedika, West Nabesche, Weston and Wicked rivers, creeks
Sub-basin:	MULTI-BASIN (Finlay, Ingenika, Residual, Mesilinka, Peace Reach, Manson, Nation, Parsnip and Crooked-Pack sub-basins)
Assessment date(s):	August, 1988
Objective(s):	To describe spawning and rearing habitats of 56 streams and rivers.
Information in report:	1. Results from videotape recordings (August, 1988 aerial survey); 2. Channel characteristics, spawning and rearing habitats described.
Follow up:	None known

Report No. 58 Planning	***Williston Lake Fisheries Compensation Program Management Plan***
Reference systems:	Williston Reservoir Watershed
Sub-basin:	MULTI-BASIN (Finlay, Ingenika, Ospika, Residual, Mesilinka, Peace Reach, Osilinka, Omineca, Manson, Nation, Parsnip, Crooked-Pack, and Dinosaur Reservoir sub-basins)
Assessment date(s):	August, 1990
Objective(s):	1. 5 year PWFWCP plan (fisheries component); 2. Summarize available physical, hydrological and limnological data; 3. Outline fish management and enhancement options on a "macrohabitat" basis (small lakes, rivers and streams, Williston Reservoir).
Information in report:	1. General description of watershed and identified fisheries resources; 2. Description of watershed management strategies.
Result(s) from work to date:	1. Riverine MW, GR and RB populations have declined since mid-1970s; relative abundance of BB and KO seems to have increased; 2. Without a suitable forage base in the rivers, BT seem to have moved into the reservoir where they feed primarily on LW; 3. Angling effort is focussed on small lakes and streams which have are becoming increasingly more accessible (logging roads); over fishing has occurred in the most popular areas.
Conclusion(s):	1. Basic information on ecology of Williston Lake KO needed; evaluate KO stream stocking option. 2. Evaluate option of stocking Williston Lake with LT and Gerrard RB; 3. Increase and diversify small lake recreational fisheries; 4. Survey more rivers and streams for baseline fisheries data; 5. Re-establish Carbon River river-resident RB fishery; 6. Use natural streams as nursery systems for RB or KO (will recruit to reservoir/embayment fisheries); 7. Preserve indigenous BT and collect basic life history data; 8. Preserve and enhance existing reservoir GR population(s).
Recommendation(s):	Management plan should provide a framework for fisheries management in the Williston Reservoir for at least five years; however, the plan should be flexible, allowing for adjustments and regular review/evaluation.

Report No. 61 Planning	*Small Lake Inventory and Enhancement Program. Preliminary Progress and Enhancement Report on 1991 Field Activities*
Reference systems:	Burden, Callazon, Clearwater, Dina (lakes), Gantahaz, Gataiga, Le Moray, Lower Manson, Upper Manson, Moree and Shoal lakes
Sub-basin:	MULTI-BASIN (Residual, Peace Reach, Manson and Nation sub-basins, and Pine River basin)
Assessment date(s):	1991
Objective(s):	To summarize information obtained during the 1991 field season on 15 lakes that were surveyed for Lake Inventory or for Stock Assessment.
Information in report:	Each lake is described briefly in terms of its fish community, habitat, enhancement options and recommendations.
Comments:	No overall conclusions or recommendations given (an "information" report).

Report No. 65 Planning	*Small Lake Program Summary, 1989-1992*
Reference systems:	Albert, Blackwater, Boot, Bruce, Burden, Butternut, Carbon, Canty, Calais, Clearwater, Crystal, Curve, Dina (lakes), Dunlevy, Emerald, Emerslund (lakes), Finger, Gantahaz, Gataiga, Grizzly, Grayling, Gwillum, Heather, Kelly, Le Moray (lakes), Lions, Little Calais, Little Carbon, Lost, McIntyre, Michelle, Moberly, Morfee, Muscovite (lakes), Pothole (lakes), Robinson, Royer, Sabai, Shoal (lakes), Tobin, Windy Point, Wolf and Wright lakes
Sub-basin:	MULTI-BASIN (Residual, Peace Reach, Omineca, Manson, Nation, Parsnip, Crooked-Pack and Dinosaur sub-basins, and Pine River basin)
Assessment date(s):	1992 (report date)
Objective(s):	Summarize PWFWCP data on 58 Williston Watershed lakes (1989-92).
Result(s):	Lake-specific data includes: (1) date of lake inventory study, (2) enhancements and potential enhancements (e.g., stocking, removal of beaver dam, etc.), (3) date of winter [D.O.] surveys, and (4) recommendations given in original report.
Follow up:	None known
Comments:	See Report No. 68 for related data.

Report No. 66 Planning	*Stream Fertilization Feasibility Study: 1991 Data Report*
Reference systems:	Mesilinka (plus Prospector Creek), Osilinka (plus Dead Bear Creek), Carbon, Manson, Misinchinka, Nation Rivers
Sub-basin:	MULTI-BASIN (Mesilinka, Osilinka, Peace Reach, Manson, Parsnip, and Nation sub-basins)
Assessment date(s):	July to October 1991
Objective(s):	To compile water temperature and chemistry data for six Williston Watershed rivers.
Information in report:	Water chemistry (pH, alkalinity, TN, $NO_2 + NO_3$, TP and orth-P) and temperature (July to October monthly means and daily mean, maximum and minimum) data compiled in tabular the graphical formats.
Follow up:	None known
Comments:	1. No formal results, conclusions, recommendations given; 2. Report also categorized as INVENTORY.

Report No. 68 Planning	***Current Status and Potential Enhancement Projects of Selected Small Lakes in the Omineca/Peace Region 1992***
Reference systems:	Albert, Blackwater, Boot, Bruce, Burden, Butternut, Carbon, Canty, Calais, Clearwater, Crystal, Curve, Dina (lakes), Dunlevy, Emerald, Upper Emerslund, Lower Emerslund, Finger, Gantahaz, Gataiga, Grizzly, Grayling, Gwillum, Heather, Kelly, Le Moray (lakes), Lions, Little Calais, Little Carbon, Lost, Lower Manson, Upper Manson, McIntyre, Michelle, Moberly, Morfee, Muscovite (lakes), Pothole (lakes), Robinson, Royer, Sabai, Shoal (lakes), Tobin, Windy Point, Wolf and Wright lakes
Sub-basin:	MULTI-BASIN (Residual, Peace Reach, Omineca, Manson, Nation, Parsnip, Crooked-Pack and Dinosaur Reservoir sub-basins, and Pine River basin)
Assessment date(s):	1993 (report date)
Objective(s):	To summarize PWFWCP data for 60 lakes.
Result(s):	1. Lake-specific data includes: (1) date of lake inventory study, (2) enhancements and potential enhancements (e.g., stocking, removal of beaver dam, etc.), (3) date of winter [D.O.] surveys, and (4) recommendations given in original report; 2. Projected activities for each lake tabulated for the period 1993-96.
Follow up:	None known
Comments:	See Report No. 65 for related information.

Report No. 70 Planning	***Fisheries Resources and Enhancement Potentials of Selected Tributaries of the Williston Reservoir, Volume II***
Reference systems:	Akie, Blackwater, Bruin, Carbon, Carmella (alias), Chichouyenily, Chowika, Clearwater, Collins, Cutthumb, Davis, Donna, Dresser, Ducette, Dunlevy, Emerslund, Gaffney, Lafferty, McAllister, Macoun, Manson, Mesilinka, Misinchinka, Mugaha, Nabesche, Nation, Pesika, Philip, Schooler, Scott, Sixmile, Weston and Winn (alias) rivers/creeks
Sub-basin:	MULTI-BASIN (Finlay, Residual, Mesilinka, Peace Reach, Manson, Nation, and Parsnip sub-basins)
Assessment date(s):	1993 (report date)
Objective(s):	To compile information available for 34 streams that have been surveyed in the Williston Reservoir watershed.
Information in report:	Channel descriptions (length, wetted/channel widths, spawning areas, mean and maximum depths, substrate characteristics, gradient, cover, habitat descriptions); electrofishing and snorkel survey data; and aging data.
Follow up:	None known
Comments:	1. No formal results, conclusions, recommendations given; 2. Report also categorized as INVENTORY.

Report No. 78 Planning	*A Review of Management and Enhancement Options for the Arctic Grayling (*Thymallus arcticus*) with Special Reference to the Williston Reservoir Watershed in British Columbia*
Reference systems:	Williston Reservoir Watershed
Sub-basin:	MULTI-BASIN (Finlay, Ingenika, Ospika, Residual, Mesilinka, Peace Reach, Osilinka, Omineca, Manson, Nation, Parsnip, Crooked-Pack, and Dinosaur Reservoir sub-basins)
Assessment date(s):	1993 (report date)
Objective(s):	Review GR ecology aspects of management and enhancement.
Information in report:	Review of literature relevant to GR ecology, management and enhancement (e.g., environmental ecology, effects of sport fisheries, enhancement and management options).
Recommendation(s):	1. Collect basic ecological information on local and regional GR stocks; 2. Preserve critical GR habitats; 3. Manage and enhance GR populations and habitat, in an adaptive and experimental manner; 4. Keep the public informed of GR management practices/concerns.
Follow up:	None known.

Report No. 82 Planning	*Development of a Premier Northern River Fishery: Mesilinka River Pre-Fertilization, Progress 1992-93*
Reference systems:	*Mesilinka River*, Nation River
Sub-basin:	MULTI-BASIN (*Mesilinka* and Nation sub-basins)
Assessment date(s):	1992-93
Objective(s):	Assess potential response of Mesilinka River food chain to nutrient additions.
Result(s):	Results include data on discharge, water temperature and chemistry, periphyton, benthic invertebrates and fish distributions.
Conclusion(s):	1. Should proceed with fertilization experiment; 2. Mesilinka River has good rearing habitat, low water temperatures (but within acceptable range for salmonid growth) and good water quality; 3. Suitable juvenile habitat available in tributaries and side channels; 4. Mesilinka River is limited by P and N availability; 5. Mesilinka River supports substantial RB, GR, BT and MW populations; 6. Mesilinka River tributaries contain significant numbers of juvenile RB and BT (fertilization expected to increase fish production).
Recommendation(s):	Use slow-release fertilizer blocks in tributaries.
Follow up:	Report No. 85 summarizes year-1 results.

Report No. 181 Planning	***Peace/Williston Fish and Wildlife Compensation Program: Annual Report 1997/98***
Reference systems:	Williston Reservoir Watershed
Sub-basin:	MULTI-BASIN (Finlay, Ingenika, Ospika, Residual, Mesilinka, Peace Reach, Osilinka, Omineca, Manson, Nation, Parsnip, Crooked-Pack, and Dinosaur Reservoir sub-basins)
Objective(s):	1. To report on program administration and planning, public consultation, projects and financial assessment of 1997-98; 2. Summarize projects conducted or on-going during 1997-98.
Information in report:	**Program administration:** 1. Two full-time biologists (Brian Blackman and Arne Langston) with technical support (Randy Zemlak); 2. Program administration involved: (1) preparation of 1996/97 Annual Quarterly Reports; (2) project accounting; (3) contract management. **Program planning:** Two Technical Committee meetings and one conference call to discuss 1997/98 projects, finances and budget. **Public consultation:** 1. Two radio programs broadcast from Mackenzie; 2. Copies of previous years' reports and three information bulletins were produced and distributed. **Objective and brief description of projects:** INVENTORY/ASSESSMENT PROJECTS (1) Table River and Anzac River GR studies; (2) Arctic Grayling Radio-Tracking; (3) GR Genetics Study; (4) Anzac River Inventory; (5) Stream Access Surveys; (6) Mesilinka River Watershed Inventory. ENHANCEMENT PROJECTS (1) Project Maintenance; (2) Mesilinka River Fertilization; (3) Stocking and KO Program; (4) Carbon Creek Side Channel; (4) Gething Bull Trout Transplant; (5) Simpson Lake Transplant; (6) Dina Lake #3 Spawning Habitat Creation; (7) Mackenzie Schools Kokanee Rearing; (8) Dinosaur Reservoir Aquatic Plant Transfer; and (9) Bullrun and Portage Creek Diversion. MONITORING/EVALUATION PROJECTS (1) Dinosaur Reservoir Habitat Improvement Evaluation; and (2) Windy Point Lake Upwelling Station Evaluation **Financial summary:** 1. Administrative costs = $58,526 (13%); (2) Planning = $38,088 (9%); (3) Public consultation: $14,034 (3%); (4) Inventory and assessment = $141,236 (32%); Enhancements = $179,503 (41%); and (5) Forest Renewal BC contribution ($244,000); 2. PWFWCP projects administered by regional BCMELP staff: Small lake surveys ($145,000); Stream video surveys ($399,000); and Mesilinka watershed inventory ($40,000).

Report No. "A" (no number) Planning	***Williston Reservoir: With Technical Comment on Current State of Aquatic Habitat (nutrients, biological production), Factors Limiting Biological Production and Recommendations for Monitoring***
Reference systems:	Williston Reservoir Watershed
Sub-basin:	MULTI-BASIN (Finlay, Ingenika, Ospika, Residual, Mesilinka, Peace Reach, Osilinka, Omineca, Manson, Nation, Parsnip, Crooked-Pack, and Dinosaur Reservoir sub-basins)
Assessment date(s):	summer 1998
Objective(s):	To briefly review existing limnological information on Williston Reservoir.
Result(s):	1. Water residence time is about 2.2 years; 2. Deep basins generally circulate twice per year (dimictic circulation); stratified (stable) from June to early October; 3. Shoreline instability (annual drawdowns) reduces littoral production; 4. Williston Reservoir is oligotrophic and gradually becoming more so (nutrient loss likely associated with increased sediment retention rates and basin export).
Recommendation(s):	1. Monitoring program should consider variables that would permit researchers to easily and accurately assess changes in production; 2. Establish permanent survey stations for consistency and replicability; 3. Monitoring program should include: (1) ***lake bathymetry*** surveys; (2) measurements of ***temperature and currents*** to describe mixing processes; (3) ***water balance and chemical budgets;*** (4) structure of flooded habitat and ***littoral zone production potential;*** (5) assessment of ***pelagic communities and food web structure***; and (6) size-fractionated ***primary production and biomass*** 4. "Ideal" monitoring program would include two years of detailed (high-frequency sampling) baseline data and two years of "periodic" sampling. Key monitoring parameters may include temperature, [D.O.], pH, TP, TDP, TN, NO_3, chlorophyll *a*, bacteria, phytoplankton and zooplankton).

Report No. "B" (in prep.) Planning	***A Strategic Plan for the Conservation and Restoration of Arctic Grayling in the Williston Reservoir Watershed***
Reference systems:	Williston Reservoir Watershed
Sub-basin:	MULTI-BASIN (Finlay, Ingenika, Ospika, Residual, Mesilinka, Peace Reach, Osilinka, Omineca, Manson, Nation, Parsnip, Crooked-Pack, and Dinosaur Reservoir sub-basins)
Assessment date(s):	1992 to 2000 (on-going)
Objective(s):	To describe ways to preserve and restore GR populations and their habitat.
Project goal:	To conserve and restore wild GR populations and their habitat.
Specific project objectives:	1. Develop a thorough understanding of GR biology in British Columbia; 2. Develop GR management strategies in view of conservation and restoration; 3. To inform public of GR management strategies to encourage public participation.
Information in report:	Report summarizes rationale, methods and schedule for activities associated with this ongoing project.

Report No. "C" (in prep.) Planning	***Peace/Williston Fish and Wildlife Compensation Program: Summary of Fisheries Activities***
Reference systems:	Williston Reservoir Watershed
Sub-basin:	MULTI-BASIN (Finlay, Ingenika, Ospika, Residual, Mesilinka, Peace Reach, Osilinka, Omineca, Manson, Nation, Parsnip, Crooked-Pack, and Dinosaur Reservoir sub-basins)
Comments:	The objectives, results and status of each PWFWCP fisheries project undertaken between 1988 and 1996 is summarized. ***1988*** (1) Reservoir gill netting studies; (2) hydroacoustic studies; (3) mercury tissue sample studies; (4) limnology; (5) dioxin monitoring program; and (6) tributary video surveys. ***1989*** (1) Stream inventory; (2) small lake inventory; (3) creel survey; and (4) Williston Reservoir survey. ***1989-96*** KO spawning surveys ***1989-97*** Stocking ***1990*** (1) Small lake surveys; (2) stream inventory; (3) Inga Lake weir; and (4) development of afisheries management plan. ***1990-91*** Lions Lake bridge and spawning habitat improvement Summit Lake net pen rearing ***1990-93*** KO model ***1990-94*** Blackwater RB stocking (Carbon and Dunlevy creeks) ***1990-97*** Mesilinka Stream fertilization experiment ***1991*** (1) Small lake surveys; (2) stream inventories; (3) adult fish traps; (4) Windy Point access improvement; (5) debris removal; and (6) Nation Lakes campsites. ***1991-96*** Carbon Creek side channel ***1992*** (1) Summit Lake stocking evaluations; (2) Dinosaur Reservoir enhancements review; (3) GR enhancements review; (4) Embayment enhancement feasibility study; (5) Gantahaz Lake enhancement and assessment; (6) Manson River inventory; (7) Tomias and Carina lakes LT investigations; (8) small lake inventories; (9) Gething Creek inventory; (10) Moberly River inventory; (11) Pine River inventory; and (12) Cameron River assessment. ***1992-93*** Nation River GR transplant ***1992-97*** (1) Dina Creek habitat improvements; (2) Windy Point upwelling station.

Report No. "C" (in prep.) Planning	***Peace/Williston Fish and Wildlife Compensation Program: Summary of Fisheries Activities***
	1993 (1) Small lake inventories; (2) small lake enhancement assessments; (3) Grizzly Lake RB transplant; (4) Pine River debris catchers; (5) Stewart Lake flow control; (6) enhancement signs; (7) Firth Creek enhancement; and (8) small lake evaluations. ***1993-96*** Gething Creek BT transplant ***1994*** (1) Small lake evaluations; (2) Dunlevy fence; (3) Nation River GR traps; (4) Grizzly (Simpson) Lake RB transplant; (5) Dinosaur Reservoir enhancement; (6) Moberly River assessment; (7) Misinchinka tributaries assessment; (8) Manson River stock evaluations; and (9) Finlay River LT assessment. ***1994-96*** Table and Anzac rivers GR surveys ***1995*** (1) Dunlevy fence; and (2) Watershed restoration (outside funding). ***1996*** (1) GR telemetry program; (2) GR stock differentiation (genetics); (3) Mackenzie schools KO rearing; and (4) Dina Lake #3 spawning habitat improvement.

Report No. C (Cont.)

PART D. ENHANCEMENT

Report No. 77 Enhancement	*Firth Creek Habitat Enhancement Project 1993*
Reference systems:	*Firth Creek*, Firth Lake
Sub-basin:	PARSNIP RIVER
Enhancement date(s):	1993 (no date given)
Objective(s):	1. Maximize the quality/quantity of spawning habitat (Firth Creek); 2. Give hands-on experience to BC Hydro's Native Environmental Youth Corp workers.
Assessment(s) prior to enhancement work:	1. Reconnaissance survey conducted in 1983; 2. Ground survey in April 1992 identified a Reach 3 site as a candidate for spawning habitat improvement; 3. Firth Creek's fish community described (results given in report).
Enhancement(s) performed:	1. Addition of spawning gravel (0.5 to 1 inch); 2. Bank stabilization (large rip-rap); 3. Habitat complexing (root groins and small rip-rap); 4. Some re-channelization.
Results/status of enhancements:	Not known
Evaluation(s)/follow up:	None known
Suggestions for future monitoring/evaluation:	None given
Comments:	Enhancement strategies described with illustrations.

Report Nos. 74, 75, 79, 83, 84, and 127 Enhancement	***Water Temperatures of the Nation and Mesilinka River Systems, 1992-1997***
Reference systems:	Nation River, Mesilinka River
Sub-basin:	MULTI-BASIN (Nation and Mesilinka sub-basins)
Enhancement date(s):	1994-ongoing?
Objective(s) of enhancement work:	To stimulate fish production in Mesilinka River with nutrient additions (Nation and Upper Mesilinka rivers used as control locations - temperature data collected to test the efficacy of control selection).
Assessment(s) prior to enhancement work:	1. Pre-fertilization temperature data (Report Nos. 74 and 75); 2. Mesilinka River Pre-fertilization Progress Report (Report No. 82).
Enhancement(s) performed:	N and P addition to two Mesilinka River reaches (Upper Mesilinka and Nation River used as controls).
Information in reports:	Each of the six reports summarizes a single season (mid-June to mid-August or mid-September) of temperature data (daily mean, maximum and minimum) in graphical and tabular formats.
Comments:	1. No formal results, conclusions or recommendations given; 2. Reports also categorized as INVENTORY.

Report No. 85 Enhancement	***Development of a Premier Northern River Fishery: Mesilinka River, The First Year of Fertilization (1994)***
Reference systems:	***Mesilinka River***, Nation River
Sub-basin:	MULTI-BASIN (Mesilinka and Nation sub-basins)
Enhancement date(s):	1994
Objective(s) of enhancement work:	To stimulate fish production in Mesilinka River with nutrient additions.
Assessment(s) prior to enhancement work:	Pre-fertilization temperature data (Report No. 74 and 75) and Mesilinka River Pre-fertilization Progress Report (Report No. 82).
Enhancement(s) performed:	N and P additions to two "treatment" reaches (T1 and T2) with Upper Mesilinka and Nation rivers as controls (T1 summer loadings = 9 μg N l^{-1} and 4.5 μg P l^{-1}; T2 summer loadings = 2.4 μg N l^{-1} and 3.6 μg P l^{-1}).
Results/status of enhancements:	1. Added P was consumed rapidly (low SRP concentrations several kms d/s of fertilizer application stations); 2. Nutrient addition increased periphyton biomass (peak biomass at T1 and T2 was 10- and 2-fold > that in Upper Mesilinka and Nation rivers, respectively; 3. Nutrient addition doubled benthic invertebrate biomass; 4. Adult fish densities were higher at treatment and control sites after fertilization (compared to before-fertilization years); 5. Fertilization did not appear to increase GR or RB size (FL and weights).
Evaluation/follow up:	Final report and publications are currently being prepared.
Suggestions for future monitoring/evaluation:	1. Rearing habitat requirements for RB, BT and GR need further study; 2. Increase benthic basket (invertebrates) sample size to increase power of statistical tests; 3. Assess the "effective zone" of fertilizer applications; 4. Add more N to T2 (d/s-most site) to relieve N limitation.

PART E. EVALUATION

Report No. 71 Evaluation	***Creel Survey of the Winter 1992/93 Gantahaz Lake Ice Fishery*** (55°22'50"N, 123°08'40"W; 93 O/6)
Reference systems:	***Gantahaz Lake***
Sub-basin:	WILLISTON RESERVOIR RESIDUAL
Enhancement date(s):	1. Stocked with BT in 1976 and 1978-92 (Mackenzie Fish & Game Association); 2. Spawning gravel added to littoral zone to facilitate shore spawning (October, 1992).
Evaluation date(s):	December 17, 1992 to February 16, 1993 (creel surveys)
Objective(s) of enhancement project:	To create a BT sport fishery and increase angling opportunities.
Objective(s) of present study/report:	1. To determine winter angler use and CPUE; 2. To evaluate success of littoral gravel placement.
Results/status of enhancement project:	1. 106 fish were caught (15% release rate/85% harvest rate); 2. CPUE = 0.20 fish/rod hr.; 3. All assessed fish (n = 23) were 3-6 years old; 4. Most anglers were from Mackenzie area.
Conclusion(s):	Stocking and management programs were successful.
Recommendation(s):	Assess success of spawning gravel additions (egg survey in spring 1993).
Comments:	Fisheries evaluation done in summer 1992 (McLean 1993, unpubl.).

Report No. 117 Evaluation	***Fish Habitat Enhancement Potential and Stocking Assessment of Dina Lake (#1)*** (55°31'35"N, 123°18'30"W; 93 O/11)
Reference systems:	***Dina Lake (#1)***, Unnamed Creeks (1 year-round inlet and 2 intermittent inlets)
Sub-basin:	WILLISTON RESERVOIR RESIDUAL
Enhancement date(s):	Stocked with RB 1987-91; with BT in 1980, 1981 and 1991.
Evaluation date(s):	June 8 and 9, 1991
Objective(s) of enhancement project:	To create a sport fishery and increase angling opportunities.
Objective(s) of present study/report:	To assess whether modifications to stocking program are required.
Results/status of enhancement project:	1. Lake supports stocked RB, stocked BT, RSC and LSU populations; 2. RB appeared healthy, although 11 had coelomic tapeworms/cysts; 3. Insects were primary food source (stomach content analysis); 4. 15 of 16 adults sample were gravid.
Conclusion(s):	Current stocking program appears to be successful.
Recommendation(s):	1. Conduct an angler CPUE survey; 2. Stock until 1995 and then re-evaluate program; 3. Stocking program may have to be modified if inlet enhancements increase natural recruitment to lake.
Comments:	1. BCMELP surveyed lake in 1979 and 1983; 2. D.A. Jesson has prepared a management report for all Dina Lakes; 3. Report also categorized as PLANNING.

Report No. 118 Evaluation	*Fish Habitat Enhancement Potential and Stocking Assessment of Dina Lake (#2)* (55°32'12"N, 123°17'36"W; 93 O/11)
Reference systems:	*Dina Lake #2*, Unnamed Creeks (1 intermittent inlet and 1 outlet)
Sub-basin:	WILLISTON RESERVOIR RESIDUAL
Enhancement date(s):	Stocked with EB in 1984 and 1987-91
Evaluation date(s):	June 20 and 21, 1991
Objective(s) of enhancement project:	To create a sport fishery and increase angling opportunities.
Objective(s) of present study/report:	Assess whether stocking program needs to be modified.
Results/status of enhancement project:	1. Lake supports stocked EB, LSU and LKC populations; 2. EB seemed healthy (no obvious parasites or diseases); 3. EB feed primarily on diet LKC, insects and snails.
Conclusion(s):	Stocking program appears to be successful.
Recommendation(s):	1. Estimate angler CPUE; 2. Continue stocking until 1995 and then re-evaluate program.
Comments:	1. BCMELP surveyed lake in 1970 and 1977; 2. D.A. Jesson has produced a management plan for all Dina Lakes; 3. Report also categorized as PLANNING.

Report No. 119 Evaluation	*Fish Habitat Enhancement Potential and Stocking Assessment of Gantahaz Lake* (55°22'50"N, 123°08'40"W; 93 O/6)
Reference systems:	*Gantahaz Lake* (no inlets or outlets)
Sub-basin:	WILLISTON RESERVOIR RESIDUAL
Enhancement date(s):	EB stocked in 1976 and 1978-91
Evaluation date(s):	June 21 and 22, 1991
Objective(s) of enhancement project:	To create a sport fishery and increase angling opportunities.
Objective(s) of present study/report:	To assess whether stocking program needs to be modified.
Results/status of enhancement project:	1. EB and LW caught in gill nets; LKC caught in minnow traps; 2. EB appeared health (only 3 had stomach tapeworms); 3. 9 of 18 sampled females were spawnbound.
Conclusion(s):	Stocking program appears to be successful.
Recommendation(s):	1. Estimate angler CPUE; 2. Keep stocking lake until 1995, then re-evaluate program; 3. Stocking program reevaluation in 1995.
Comments:	1. BCMELP surveyed lake in 1970; 2. Report also categorized as PLANNING.

Report No. 122 Evaluation	***Fish Habitat Enhancement Potential and Stocking Assessment of Morfee Lake*** (55°21'12"N, 123°04'20"W; 93 O/6)
Reference systems:	***Morfee Lake***, Morfee Creek (outlet), Unnamed Creeks (3 intermittent inlets)
Sub-basin:	WILLISTON RESERVOIR RESIDUAL
Enhancement date(s):	Lake stocked with RB since 1976 and LT in 1978.
Evaluation date(s):	June 10 and 11, 1991
Objective(s) of enhancement project:	To create a sport fishery
Objective(s) of present study/report:	To assess whether stocking program needs to be modified.
Results/status of enhancement project:	1. CSU (27% TC), MW (22%), RB (20%) and PCC (11%) were most frequently caught species; 2. RB feed primarily on insects (stomach analysis); 3. RB seemed healthy (stomach tapeworms observed in two fish, coelomic tapeworms in four); 4. Angler CPUE was about 5 salmonids/hr.; 5. RB grow limited between age two and three; 6. Salmonids and coarse fish observed in outlet.
Conclusion(s):	Current stocking program appears to be successful.
Suggestions for future monitoring/evaluation:	Continue stocking program until 1995 and then re-evaluate program.
Comments:	Study also falls into the PLANNING category.

Report No. 124 Evaluation	***Fish Habitat Enhancement Potential and Stocking Assessment of Canty Lake*** (55°57'21"N, 123°42'23"W; 93 O/13)
Reference systems:	***Canty Lake***, Unnamed Creeks (3 inlets), Canty Creek (outlet)
Sub-basin:	WILLISTON RESERVOIR RESIDUAL
Enhancement date(s):	Lake stocked with RB in 1990 and 1994
Evaluation date(s):	October 6 and 7, 1994
Objective(s) of enhancement project:	To create a sport fishery and increase angling opportunities.
Objective(s) of present study/report:	To evaluate the success of RB stocking program.
Results/status of enhancement project:	1. RB only species caught in gill nets; 2. 35 of 37 RB sampled were maturing; two were mature; 3. Five females re-adsorbed eggs; 4. RB feed primarily on insects (stomach analysis); 5. 13 of 37 RB sampled had parasites on internal organs; 6. Outlet obstructed by beaver dam at lake mouth.
Conclusion(s):	1. Stocking program appears to be successful; 2. Outlet beaver dam may hinder natural recruitment.
Recommendation(s):	A satisfactory sport fishery will be maintained by current stocking schedule (once every four years).
Comments:	1. See Report No. 87 for inventory data; 2. Report also categorized as PLANNING.

Report No. 172 Evaluation	*Fish Trapping Operation on Dunlevy Creek, 1995*
Reference systems:	*Dunlevy Creek*
Sub-basin:	PEACE REACH
Enhancement date(s):	Lake stocked with RB in 1990 and 1991; KO in 1990 to 95.
Evaluation date(s):	May 9 to October 30, 1995
Objective(s) of enhancement project:	To create a sport fishery and increase angling opportunities.
Objective(s) of present study/report:	To collect ecological information on existing fish populations (abundance, movements and distributions, and KO and RB return rates).
Results/status of enhancement project:	1. Six month trapping operation had the following catch: (1) 14,809 suckers; (2) 10,862 PCC; (3) 1,180 whitefish; (4) 960 RB ($\bar{X}$ FL = 274mm, $\bar{X}$ weight = 228g); 270 BT ($\bar{X}$ FL = 287mm; $\bar{X}$ weight = 218g); 104 KO ($\bar{X}$ FL = 297mm, $\bar{X}$ weight = 248g); 59 sculpins; 8 NSC; and 1 BB. 2. Most BT were 3 years old; RB 4 years old; 3. Stocked KO survivorship about 0.4% (fry to spawning adult); 4. 4 of 964 sampled RB were of hatchery origin; 5. Spawning RB spent an average of 21d in creek; 6. BT population only use creek for summer feeding.
Conclusion(s):	No specific conclusions given.
Recommendation(s):	Quantify salmonid survivorship (juvenile to adult).
Comments:	Report also categorized as INVENTORY.

Report No. 116 Evaluation	*Fish Habitat Enhancement Potential and Stocking Assessment of **Burden Lake*** (55°30'30"N, 123°33'12"W; 93 O/12, O/5)
Reference systems:	***Burden Lake***, Unnamed Creek (1 outlet)
Sub-basin:	NATION RIVER
Enhancement date(s):	Lake stocked with RB 1977 to 1980, 1982, 1984, 1986-91
Evaluation date(s):	June 24 and 25, 1991
Objective(s) of enhancement project:	To create a sport fishery and increase angling opportunities.
Objective(s) of present study/report:	To determine if alterations to the current stocking program are recommended.
Results/status of enhancement project:	1. Gill nets caught primarily LSU (77% TC) and RB (21%); minnow traps primarily LKC (93%); 2. RB seemed healthy; all sampled fish were gravid; 3. RB growth slow between ages 3 and 4.
Conclusion(s):	Current stocking program appears to be successful.
Recommendation(s):	1. Estimate angler CPUE; 2. Keep stocking lake until 1995, then re-evaluate program; 3. Assess feasibility of stocking all-female Pennask RB and/or EB.
Comments:	1. BCMELP surveyed lake in 1983; 2. Lake has a Forest Recreation Site; 3. Report also categorized as PLANNING.

Report No. 123 Evaluation	***Fish Habitat Enhancement Potential and Stocking Assessment of Bruce Lake*** (55°08'29"N, 122°54'49"W; 93 O/2)
Reference systems:	***Bruce Lake***, Unnamed Creeks (1 inlet, 1 outlet)
Sub-basin:	PARSNIP RIVER
Enhancement date(s):	RB fry stocked in autumn, 1989
Evaluation date(s):	October 3 to 5, 1994
Objective(s) of enhancement project:	To create an RB sport fishery.
Objective(s) of present study/report:	To evaluate success of 1989 RB stocking.
Results/status of enhancement project:	1. Gill nets (40.5 hours) caught 2 RB and 12 LKC; minnow traps 131 LKC; 2. No spawning habitat was identified and rearing habitat was poor.
Conclusion(s):	1. The 1989 RB stocking was successful, however, remaining fish have reached the end of their life span; 2. Angler use (particularly winter) justifies a low intensity stocking program.
Suggestions for future monitoring/evaluation:	Stocking assessment recommended to be done 2-3 years following further stocking to gauge survival and growth.
Follow up:	Lake stocked with EB in 1995 (stocked every 2nd year to maintain low to moderate use fishery).
Comments:	1. Lake inventoried in 1989 (Report No. 86); 2. Report also in PLANNING category.

Report No. 73 Evaluation	*Dinosaur Lake Summer Creel Surveys - Results of the 1988 Program and a Five Year Review (1984-1988)*
Reference systems:	*Dinosaur Reservoir*
Sub-basin:	DINOSAUR RESERVOIR
Enhancement date(s):	1982 (initiation of RB stocking program)
Evaluation date(s):	1984 to 1988
Objective(s) of enhancement project:	Mitigate fisheries impacts of Peace Canyon Dam.
Objective(s) of present study/report:	To summarize 1984 to 1988 creel data (trend analysis).
Results/status of enhancement project:	1. RB predominant species caught by anglers (hatchery RB comprised about 50% of total RB catch); 2. Hatchery and wild RB had good growth rates and similar year-to-year age and size distributions; 3. Angler hours and RB catch were greatest in 1984 (1st year lake open to anglers); 4. Angler CPUE was low (<0.40 fish/hour); 5. Most anglers were from Peace River Region (>75 %).
Conclusion(s):	No specific conclusions given.
Suggestions for future monitoring/evaluation:	None given

Report No. 176 Evaluation	*Williston Reservoir Stocked Kokanee Spawning Assessment, 1994*
Reference systems:	**Carbon Creek, Dunlevy Creek**, *Eklund Creek, Manson River, Nation River,* Philip Creek, Morfee Creek, Mugaha Creek
Sub-basin:	MULTI-BASIN (Peace Reach, Residual, Manson, and Nation sub-basins)
Enhancement date(s):	Stocking program initiated in 1990
Evaluation date(s):	August 23 to October 25, 1994
Objective(s) of enhancement project:	Create a new, self-sustaining KO population and to improve existing fishery.
Objective(s) of present study/report:	To evaluate the Williston Reservoir KO stocking program.
Results/status of enhancement project:	1. Netting at three sites (bold above) yielded 135 KO (RB, whitefish, PCC, BT, NSC, RSC and suckers also captured); 2. KO only observed in Dunlevy and Philip creeks during aerial surveys of 6 sites (bold and italics above); no KO observed during ground surveys of Carbon, Dunlevy, Morfee and Mugaha creeks;
Conclusion(s):	1. Stocked KO probably spawn in late September; 2. Stocking program seems successful; however, unclear as to whether KO population is self-sustaining; 3. Further study of stocked KO populations needed.
Suggestions for future monitoring/evaluation:	Stocked KO population requires further study.

PART F. PUBLIC CONSULTATION

Report No. 9 Consultation	***Public Consultation Report 1990/91***
Objective(s):	To report on 1990/91 PWFWCP public consultations.
Public Consultation Objective(s):	1. To inform the public of past and in-progress PWFWCP projects and rationale; 2. To ask for public input.
Public Consultation Activities:	Two workshops held in Hudson's Hope and Mackenzie.
Results of workshops & open houses:	1. BC Hydro has set an example to industry with PWFWCP; hope that government agencies and industry work together to preserve fish and wildlife communities; 2. Program management structure could use more local representation; 3. Integrated resource management a high priority (balance between studies and action projects); 4. Emphasize biodiversity (consider all species, not just game species).

Report No. 17 Consultation	***Public Consultation Report 1991/92***
Objective(s):	To report on 1991/92 PWFWCP public consultations.
Public Consultation Objective(s):	1. To inform the public of past and in-progress PWFWCP projects and rationale; 2. To ask for public input.
Public Consultation Activities:	Two workshops held in Hudson's Hope and Mackenzie.
Results of workshops & open houses:	1. Improve reporting of Program expenditures, administration costs, budgets, etc.; 2. Emphasize biodiversity (consider all species, not only game species); 3. Program should try to stimulate tourism interests in area; 4. Ask for local input (e.g., from natives, trappers, guide outfitters and naturalists – people who have vested or personal interests in area); 5. Encourage BCMELP-Program partnerships; 6. Increase proportion of "action" activities to "study" activities; 7. Program should put some emphasis on pollution studies (e.g., mercury and PCBs).

Report No. 27 Consultation	***Public Consultation Report 1992/93***
Objective(s) of report:	To report on 1992/93 PWFWCP public consultations.
Public Consultation Objective(s):	1. To inform the public of past and in-progress PWFWCP projects and rationale; 2. To ask for public input.
Public Consultation Activities:	1. Production of two "Natureline" newsletters; 2. Community open houses in Fort St John, Chetwynd, Prince George and Mackenzie; 3. Mall displays and television, radio and newspaper coverage; 4. Meetings with interest groups.
Results of workshops & open houses:	1. Anglers prefer fishing in area small lakes and rivers; 2. Support for catch-and-release only legislation for some river systems; 3. PWFWCP habitat enhancement efforts were considered to be "about right" for rivers, reservoirs and small lakes; 4. Gamefish in order of angler preference: RB, BT, GR, KO, WP and LT.

Appendix A

(Projects done in the Pine River Watershed)

Report No. 107 Lake Inventory	***A Reconnaissance Survey of Le Moray Lake (#1)*** (55°27'55"N, 122°30'05"W; 93 O/8)
Reference systems:	***Le Moray Lake #1***, Unnamed Creeks (2 inlets and 1 outlet)
Sub-basin:	PINE RIVER
Survey date(s):	September 8 to 10, 1991 (autumn) and March 14, 1991 (winter)
Objective(s):	To assess the physical, chemical and biological characteristics of Le Moray Lake #1 and its immediate watershed.
Result(s):	1. Stratified on autumn survey dates (thermocline between 11 and 14m); 2. Summer [D.O.] decreased with depth; no anoxia observed (Z_m = 20.8m; A_o = 181,000 m^2; $\bar{Z}$ = 8.1 m; V = 1,461,000 m^3); 3. Inversely stratified on winter sampling date (weak); 4. Most of water column hypoxic (no measurements taken below 16m); 5. No fish caught in gill nets or minnow traps; 6. Inlet #1 has poor spawning habitat, but fair juvenile rearing habitat; 7. U/S-most 30m of outlet had moderate spawning and rearing habitats.
Conclusion(s):	1. Lake is barren; 2. Winter [D.O.] could support a fish population.
Recommendation(s):	1. Could stock lake with sportfish; 2. Fish introduced to lake could move to Pine River (no barriers observed in outlet); 3. Adding spawning gravel to inlets and outlet could facilitate natural recruitment of stocked fish; 4. Inventory nearby Le Moray Lakes #2 and #3.
Follow up:	Inventories of Le Moray Lakes #2 and #3 (Report Nos. 135 and 136).

Report No. 110 Lake Inventory	***A Reconnaissance Survey of Simpson Lake*** (55°32'04"N, 122°40'15"W; 93 O/10)
Reference systems:	***Simpson Lake***, Unnamed Creeks (1 outlet, 2 year-round inlets, 7 intermittent inlets)
Sub-basin:	PINE RIVER
Survey date(s):	September 6 and 7, 1991 (autumn) and February 28, 1990 (winter)
Objective(s):	To assess the physical, chemical and biological characteristics of Simpson Lake and its immediate watershed.
Result(s):	1. Summer thermocline between 9 and 11-m depth; 2. Summer hypoxia at 18m and below; small [D.O.] peak at 12m (Z_m = 21.4m; A_o = 312,000 m^2; $\bar{Z}$ = 8.8 m; V = 2,760,000 m^3); 3. Inversely stratified on winter sampling date; 4. Winter [D.O.] > 4 mg/L through water column; 5. No fish were caught in gill nets or minnow traps; 6. Inlets and outlet have a moderate spawning and rearing habitats.
Conclusion(s):	1. Lake is barren; 2. Winter [D.O.] could support a fish population.
Recommendation(s):	1. Could stock lake with sportfish; 2. Stocked fish will be able to move to Pine River (no barriers in outlet); 3. Addition of gravel to inlets and outlets could facilitate stocked fish spawning.
Follow up:	Lake stocked with RB in 1994 (Report No. 139).

Report No. 133 Lake Inventory	***A Reconnaissance Survey of Otto Lake*** (55°25'29"N, 122°24'26"W; 93 O/8)
Reference systems:	***Otto Lake***, Unnamed Creeks (1 year round inlet, 3 intermittent inlets, outlet)
Sub-basin:	PINE RIVER
Survey date(s):	August 10 to 11, 1992 (summer) and March 14, 1991 (winter)
Objective(s):	To assess the physical, chemical and biological characteristics of Otto Lake and its immediate watershed.
Result(s):	1. Summer thermocline between 4 and 8-m depth; 2. Summer hypoxia at 10m; slight [D.O.] peak at 4.5-5m (Z_m = 11.3m; A_o = 190,000 m^2; $\bar{Z}$ = 4.4 m; V = 840,000 m^3); 3. Inversely stratified in winter; [D.O.] > 4 mg/L above 7.5m; 4. Lake may be barren (no fish caught in gill nets or minnow traps); 5. Inlet #1 and outlet had good rearing potential;
Conclusion(s):	1. Lake is barren; 2. Winter [D.O.] could support fish; 3. Cold water temperatures may slow growth rates of any introduced RB.
Recommendation(s):	1. Could stock lake with sport fish; 2. Introduced fish could move to Pine River (no barriers in outlet); 3. Gravel addition to outlet to permit spawning (if stocked).
Follow up:	None known

Report No. 134 Lake Inventory	***A Reconnaissance Survey of Wolf Lake*** (55°29'08"N, 122°13'10"W; 93 O/8)
Reference systems:	***Wolf Lake***, Unnamed Creeks (1 inlet, 1 outlet)
Sub-basin:	PINE RIVER
Survey date(s):	August 12 to 13, 1993 (summer) and March 14, 1991 (winter)
Objective(s):	To assess the physical, chemical and biological characteristics of Wolf Lake and its immediate watershed.
Result(s):	1. Lake isothermal on summer sampling date (slight drop near bottom); 2. Summer [D.O.] decreased slightly with decreasing temperature; hypoxic at 15-m depth (Z_m = 17 m; A_o = 102,000 m^2; $\bar{Z}$ = 7.1 m; V = 723,000 m^3); 3. Inversely stratified on winter sampling date; 4. Winter [D.O.] > 4 mg/L above 11m (deeper water not sampled); 5. Wolf Lake is probably barren (no fish caught in gill nets or traps); 6. No spawning habitat and marginal rearing habitat in creeks.
Conclusion(s):	1. Wolf Lake is barren; 2. Winter [D.O.] could support fish; 3. Stocked RB would likely have very slow growth rates (cold water).
Recommendation(s):	1. Lake could be stocked; 2. Introduced fish may be able move to Pine River (no known barriers); 3. Stocking would have to be done repeatedly (no suitable spawning habitat).
Follow up:	None known
Comments:	Angling use would likely be low even if lake was stocked (lake very remote).

Report No. 135 Lake Inventory	***A Reconnaissance Survey of Le Moray Lake #2*** (55°28'00"N, 122°29'30"W; 93 O/8)
Reference systems:	***Le Moray Lake #2***, Unnamed Creeks (1 year-round inlet, 3 intermittent inlets, 1 outlet)
Sub-basin:	PINE RIVER
Survey date(s):	August 29 and 30, 1992 (summer) and March 3, 1992 (winter)
Objective(s):	To assess the physical, chemical and biological characteristics of Le Moray Lake #2 and its immediate watershed.
Result(s):	1. Summer thermocline between 4 and 7-m depth; 2. Summer [D.O.] peaked at 6m, then decreased with depth; hypoxic at 12m (Z_m = 15 m; A_o = 90,000 m^2; $\bar{Z}$ = 5.6 m; V = 505,000 m^3); 3. Inversely stratified on winter sampling date; 4. Winter [D.O.] decreased with depth; hypoxic at and below 9m; 5. Lake probably barren (no fish caught in gill nets or traps) 6. Inlets #3 and #4 had fair to moderate spawning habitat; inlet #1 had fair rearing habitat.
Conclusion(s):	1. Lake is barren; 2. Winter [D.O.] could support fish; 3. Any stocked RB would have slow growth rates (cold water).
Recommendation(s):	1. Lake could be stocked with sportfish; 2. Introduced fish could move to Pine River (outlet has no known barriers); 3. Improve chanelization and enhance spawning habitats of inlet #1; 4. Enhance outlet spawning habitat and clearance (if stocked); 5. Management lake in conjunction with Le Moray Lakes #1 and #3.
Follow up:	None known
Comments:	Le Moray Lakes #1 and #2 have been surveyed (Report Nos. 106 and 136).

Report No. 136 Lake Inventory	***A Reconnaissance Survey of Le Moray Lake #3*** (55°28'06"N, 122°29'04"W; 93 O/8)
Reference systems:	***Le Moray Lake #3***, Unnamed Creeks (2 intermittent inlets, 1 outlet)
Sub-basin:	PINE RIVER
Survey date(s):	August 28 and 29, 1992 (summer) and March 3, 1992 (winter)
Objective(s):	To assess the physical, chemical and biological characteristics of Le Moray Lake #3 and its immediate watershed.
Result(s):	1. Summer thermocline between 5 and 8-m depth; 2. Summer [D.O.] > 4 mg/L through water column (Z_m = 9.5m; A_o = 73,100 m^2; $\bar{Z}$ = 2.4 m; V = 176,000 m^3); 3. Inversely stratified on winter sampling date; 4. Winter hypoxia at 3m; anoxic at 5m; 5. Lake probably barren (no fish caught in gill nets or traps); 6. Inlet #1 had marginal spawning habitat and moderate rearing habitat; 7. Outlet had no spawning habitat, but fair rearing habitat throughout.
Conclusion(s):	1. Lake is barren; 2. Winter [D.O.] are marginal; 3. Any stocked RB would have slow growth rates (cold water).

Report No. 136 Lake Inventory	***A Reconnaissance Survey of Le Moray Lake #3*** (55°28'06"N, 122°29'04"W; 93 O/8)
Recommendation(s):	1. Could stock lake with sportfish; 2. Introduced fish may be able to access Pine River (no known barriers); 3. Could improve outlet spawning habitats, channelization and clearance; 4. Inlet #1 should be enhanced if lake stocked (spawning habitat and stream clearance); 5. Lake should be managed in conjunction with Le Moray Lakes #1 and #2.
Follow up:	None known
Comments:	Le Moray Lakes #1 and #2 have been surveyed (Report Nos. 106 and 135).

Report No. 136 (Cont.)

Report No. 139 Enhancement	***Simpson Lake Rainbow Trout Transplant, 1994*** (55°32'04"N, 122°40'15"W; 93 O/10)
Reference systems:	Simpson Lake
Sub-basin:	PINE RIVER
Enhancement date(s):	August 5 and October 19 and 20, 1994
Objective(s) of enhancement work:	To create a new lake fishery that will diversify angling opportunities and relieve pressure on wild fish stocks.
Assessment(s) prior to enhancement work:	1991 survey (Report No. 110) indicated that lake was barren, but that it could support a fish population.
Enhancement(s) performed:	Twenty-six RB taken from the W.A.C. Bennett Dam intake tower were put in Simpson Lake.
Results/status of enhancements:	The number of fish transplanted to Simpson Lake may not have been enough to establish a viable population.
Evaluation(s)/follow up:	Plan to stock lake with RB in 1995.

Report No. 67 Stream Inventory	***Stream Surveys of the West (Upper) Moberly River Watershed (Summer, 1992)***
Reference systems:	West (Upper) Moberly River Watershed
Sub-basin:	MOBERLY RIVER
Survey date(s):	Summer, 1992
Objective(s):	1. To describe fish community (sport and non-sport species); 2. Survey, categorize and map fish habitat; 3. Describe GR, BT and RB population characteristics (density, distribution, age structure, recruitment and growth); 4. To assess enhancement options.
Result(s):	1. Most captured fish were described as "coarse fish" (>86% TC); 2. Few sportfish caught: 12 BT, 7 RB and 7 whitefish); thus, population statistics not computed (age structure and growth); 3. Several tributaries had substantial beaver activity; 4. Early June temperatures were low (typically $<12\ ^{\circ}C$, max. $= 17^{\circ}C$); 5. Juvenile RB most common in areas having gravel and larger substrates, deep pools and cutbanks; BT most common in areas having "large" substrates and deep-pool cover; 6. No GR observed; however, habitat could support GR; 7. MW observed at several sites; however, they were never abundant; 8. Most obstructions were beaver dams and log jams.
Conclusion(s):	1. West Moberly system has several breeding fish populations, but fish densities were low; 2. Many sites had suitable BT, RB and MW habitat.
Recommendation(s):	1. Should undertake snorkel surveys; 2. Beaver dam and log jam removal should be considered.
Follow up:	None known

Report No. 60 Planning	***Walleye Feasibility Study: Moberly and Gwillim Lakes***
Reference systems:	Moberly Lake, Gwillim Lake
Sub-basin:	Moberly River, Pine River
Assessment date(s):	November 1989 to Summer 1990
Objective(s):	-
Result(s):	1. Upper (West) Moberly River and Smokehouse Creek (Gwillim System) flowed all winter and provided a variety of suitable habitats for fish. 2. Other tributaries had limited utility because of unstable substrates and the absence of pools. 3. Sport fish captured in Moberly Lake were lake whitefish, northern pike, lake char, and burbot. 4. Sport fish captured in Gwillim Lake were lake whitefish, lake char, burbot, bull trout, Arctic grayling, rainbow trout and northern pike. 5. For walleye habitat suitability (using Life Requisite Indices), both the Moberly Lake and Gwillim Lake systems were unsuitable in terms of water quality and reproduction because of low temperatures, but had good to excellent food, cover and trophic status. 6. No suitable walleye spawning habitat was observed in the 10 km reach immediately upstream of Moberly Lake. 7. Both lakes were marginally oligotrophic, but Moberly Lake appeared to be more productive than Gwillim Lake.
Conclusion(s):	1. Moberly and Gwillim Lakes are only moderately productive. 2. The lakes are limited in salmonid production by poor stream conditions and/or inaccessibility. 3. The principal sportfish populations are low in abundance.
Recommendation(s):	1. Implementation of species specific harvest regulations that take into account production capabilities, enhancement opportunity and angler preferences. 2. Routine reassessment to ensure regulations remain applicable as more complete information is obtained on fish populations. 3. More specific studies to assess enhancement opportunities for lake char, rainbow trout, bull trout and Arctic grayling. 4. Basic stream enhancement work should be conducted on Smokehouse Creek: improve fish passage through the highway culvert under varying discharge conditions. 5. Moberly Lake is the best candidate for experimental stocking of walleye. 6. Only local stocks should be used as donors in order to preserve the gene pool in the Peace River.
Follow up:	None known